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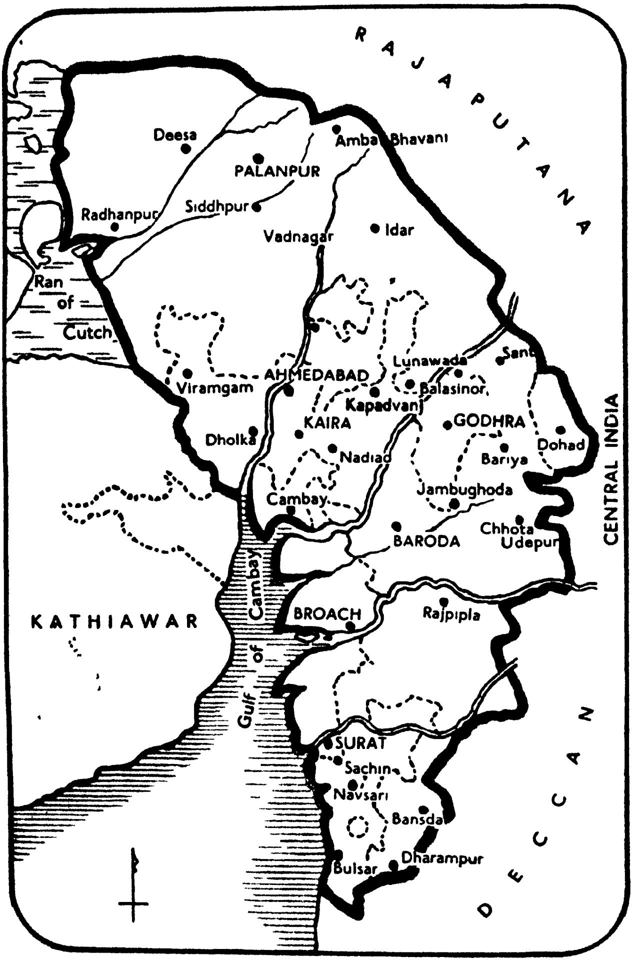
WEALTH OF GUJARAT



GUJARAT

Regional Back-ground

WEALTH OF GUJARAT

BY

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' KATHIAWAR ECONOMICS '
and
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Birla College, Pilani, Jaipur State.

TO THE TWO DISTINGUISHED MEMBERS
OF STOCK EXCHANGE

Sjt. Kalyanbhai Chhaganbhai Nanavaty is one of the distinguished members of Stock Exchange who has taken live interest in the publication of this work. Born of a middle class Jain family in 1890 at Ahmedabad Sjt. Nanavaty matriculated at a very young age of 14 years. Thereafter for higher studies, he joined Gujarat College, but it seems Providence had ordained for him a business career.

At the young age of 16 in 1906 he joined Punjab National Bank Limited as an Accountant. After a short while, he joined the Bombay Merchants' Bank Ltd. as an Assistant Accountant and within six months due to his sheer abilities the management of this bank appointed him as the Manager of their Ahmedabad Branch. He worked in this capacity for about four months. Thereafter he joined the Poona Bank Ltd's. Bombay Branch as an Accountant, and, soon he was appointed the Manager of the Kalbadevi Branch of the said Bank. After serving in this bank for three and half years, Sjt. Nanavaty joined the welknown Sholapur Spinning and Weaving Mills Ltd. Sholapur as an Accountant and worked there for twenty three years. In addition, later on, he worked as the Assistant Manager of the said mills for about six months.

Sjt. Nanavaty then retired, and became a permanent member of the Bombay Native Share and Stock Brokers' Association in 1939. His services in the limited companies especially in the banking concerns and the textile mills as the Accountant gave him ample experience in judging correctly the balance sheet and the financial position of the limited concerns, as a result, in a couple of years he has been able to establish good reputation as one of the leading Stock Brokers of Bombay.

Sjt. Nanavaty has made several donations, of which the one of Rs. 30,000 to the "Jasodabai Prasuti Griha" Ahmedabad is the prominent one. I am highly indebted to Sjt. Nanavaty for financially helping me in the publication of this work, which is bound to be very useful to the industrialists and the administrators of Gujarat.

A. B. TRIVEDI,
Author.

FOREWORD

WITH great pleasure I pen a few lines about Prof. A. B. Trivedi's publication "Wealth of Gujarat". Prof. Trivedi is a keen student of Indian Economics, and, as a research scholar he has given definite lead to the Indian Economists for insipring them to handle the regional surveys of India. Lack of such surveys hamper the State effort to evolve a well-planned economy for the country as a whole, and, viewed from this angle, Prof. Trivedi needs be congratulated in these his pioneer efforts.

As the Investigator of the Northern Division of the Bombay Economic and Industrial Survey Committee, Prof. Trivedi studied the economic and industrial conditions of the British Gujarat and this practical experience has stood him in good stead in his further investigations of the economic and industrial conditions of Gujarat as a whole.

His work, I find, rendered more valuable by the use of authentic statistics, incorporation of his personal findings, and the use of all available State publications. In this book the author clearly brings out that Gujarat's economic resources need further development, and that there is immense scope for new industries in this region. What is, therefore, needed is (*i*) a planned economy, (*ii*) a good and well regulated channel of transport, (*iii*) democratization of State Administration (otherwise, capital will feel shy) and (*iv*) trained labour.

I hope, to the financiers, the businessmen, and the industrialists of Gujarat, this valuable document will open up new means of investments for their capital, and that this work of Prof. Trivedi will go a great deal in directing the State in its Post-war Reconstruction Programme.

102, Stock Exchange,
Bombay.
11th August 1943

NAVALCHAND T. SHAH,
B.A.,
Stock Broker.

PREFACE

Being well conversant with the economic and the industrial conditions of Kathiawar and British Gujarat, I thought of undertaking a special survey of Gujarat. I have, therefore, been able to utilise in this work my previous experience. I prepared special questionnaires for the (*i*) Social Workers, (*ii*) Artisans, and (*iii*) Dealers.

First of all 750 copies of the General Questionnaire were forwarded to the (*i*) leading officers, (*ii*) citizens, and (*iii*) social workers, and (*iv*) business magnets of Gujarat. After thus establishing my contact with these people, I entered into further communication with them; and later on I toured to the various parts of Gujarat for gathering firsthand information, and obtaining the necessary literature on the subject at hand.

I gathered during my tour about 350 books, leaflets and reports. Mostly they are State Administration Reports, State Geographies, Inter-State Tariff Schedules, Geological Survey Reports, Maps, etc. I also filled in 800 statements from the (*i*) artisans, (*ii*) manufacturers, and (*iii*) dealers of the centres which I visited. By interviewing the State Officers, and the public leaders, I also collected valuable information about the economic conditions of their territories.

Being on the Staff of the Khalsa College, I had to spread my work over the period of five years. For, I could only get time to travel during the vacations. But, during the interval I made use of the data collected, and, I communicated for the further illucidation of some of the points which I had jotted down in the course of my tours. Hence I could become more precise and could gather more and more material for my work in every successive tour.

After finishing my industrial pilgrimage of Gujarat, I maintained the contact with the State Officers and the leading citizens of those places by correspondence. As a result I have been able to make my work as thorough and complete as possible.

However, there are bound to be some defects in this work when we remember, as yet neither proper geological survey is made of this region, nor the (*i*) Physical, (*ii*) Regional, (*iii*) Economic, (*iv*) Commercial or (*v*) Political Geography of Gujarat proper ('Mul-Gujarat') is written so far. In addition, no light has, as yet, been thrown on the Economic History of this area. Added to these, the statistics about the (*i*) Forest acreage, (*ii*) Cultivated land, (*iii*) Cultivable land lying idle, (*iv*) Fallow land, (*v*) Waste land, (*vi*) Number of industrial concerns and the persons employed by them, (*vii*) Road mileage, (*viii*) Number of artisans, etc. are not maintained by the various States of Gujarat. No State Administration Report gives per acre yield of the crop; while many States do not keep record of the acreage under cultivation of chief crops.

This is, therefore, the pioneer work, a first systematic attempt to survey Gujarat's resources and their existing conditions.

In our survey we find that deficient equipments, inefficient labour, inadequate transport system and marketing facilities, and in addition indifferent State attitude, these are the special evils hampering the economic and industrial growth of Gujarat.

The existence of the three systems of production *viz*: of (*i*) large scale, (*ii*) small scale, and, (*iii*) cottage industries producing the same articles or goods and catering for the requirements of the same markets, fortells the existence of the *interse* unhealthy competition and a lack of bold State policy.

The existence of so many different jurisdictions increase the magnitude of these evils and render the situation more complicated. Under the circumstances no unified policy, which is essential for the economic and industrial growth of the region, can be adopted.

Most of the handicaps are, therefore, of politico-economic character, and, our suggestions will remain theoretical ones, that is, they will be of purely academic interest as long as 'Responsible Element' is not introduced in the Administration of this region. For, everybody knows that economics without politics bears no fruit.

As for the scope and the nature of our work, a few lines will not be out of place. Part I of our thesis, deals with the Economic Resources of Gujarat. Very little is hitherto known about Gujarat's economic and industrial resources and their potentialities. Even though Gujarat is considered to be one of the highly industrialized parts of India, we find her claim being justified only by the industrial uprising in the British Gujarat and the Baroda State territories. The Rest of the Gujarat is divided into something like 200 small jurisdictions, and the meagre resources of the most of these petty Chiefs preclude them from undertaking any scheme for the industrial and economic regeneration of their estates.

Most of the interior States of Gujarat are immune from the swifter means of communication *viz* : railways, and their subjects increasingly depend upon agriculture. We, therefore, find the literacy ratio for Gujarat as a whole to be lower than that of Kathiawar.

The subjects of the States of southern and the eastern border of Gujarat are comparatively more backward. For, these are the hilly tracts and forest areas, where many forest tribes ('Rani Paraj') reside.

In our survey of her resources we find Gujarat blessed with 200 miles of broken coastline in the west. There are important roadsteads on this coastline, as every river mouth affords a creek which naturally gave rise to the growth of a village in the past, the inhabitants of which took to fishing. Such important roadsteads are Sarod, Kavi, Tankara, Jambusar, Sajod, Hansot, Bhagwa, Maroli, Navsari, Matwad, Dandi etc. Here fishing affords immense scope for further development. In addition, if the saltworks are established at the suitable places on the coastline, scope for the establishment of alkali works cannot be overlooked. The existence of lime, sea salt, and gypsium on the coastal strip guarantees good prospects for the cement industry. Moreover, water transport is always cheaper than the land transport. If India's coastal trade is reserved for the indigenous shipping companies, these roadsteads are bound to hum with active business life.

Gujarat is also richly endowed with forest resources, and they are capable of further development; she claims to her credit, more than 1½ million acres forest areas, and, immense industrial possibilities exist in this connection. But, it appears that the importance of this forest wealth to the economic life of the province is not yet realised. As such, little use of her forest produce is made within this province. Otherwise match industry, paper industry, lac refineries, etc., would have been established long ago in Gujarat. Plantation also has a good scope in this region. Gujarat is also rich in mineral resources, as will be realised from the availability of asbestos, talc, china clay, mica, manganese and iron ore in the different parts of this region. But as most of these ores are found in the Interior States of Gujarat lack of (*i*) transport facilities (*ii*) State encouragement, and (*iii*) necessary capital, have come in the way of their development.

Out of her 21 million acres land, 14 million is already taken into cultivation. But of this 14 million acres, about one million remains fallow every year, while hardly half a million acres is irrigated. Irrigated in the sense that they receive water mainly from wells. Hence, even when the soil is fertile, the lack of irrigation facilities preclude the cultivation of second crop in most of the cultivable lands.

On the other hand, the topography of this region is such that it has laid her agricultural lands open to the devastation of floods. Gujarat, therefore, needs expert engineers and scientists to guide her destinies.

There are about 2 million acres waste lands in Gujarat which can either be converted (*i*) into the forest areas by planting the trees, or (*ii*) into the pasture lands by cultivating turnips, clover, grass, etc., for encouraging the cattle-breeding.

As regards her cattle wealth, Gujarat fares well if statistics of some of the other countries are referred for the sake of comparison. But the actual condition is quite the reverse. More than 15 per cent of the total number are old cows and buffaloes. They are too old to breed or to yield milk. If the cattle breed is improved (instead of importing better quality hides and wool from outside the province) Gujarat's industrial needs of animal produce will be supplied by her own cattle wealth.

The dearth of adequate transport facilities in the Gujarat States (excluding Baroda) is deplorable. It is coming in the way of the development of the forest and mineral resources of the Interior and the Frontier Gujarat States. It also comes in the way of the agriculturists who do not obtain fair price of their produce in the interior. It also hampers the social contact, and hence the growth of mental outlook among the masses of the interior. Out of 1720 miles railways, excluding the Government of India and Baroda, the remaining States own only 78.23 miles railways in Gujarat.

As for the Part II of my book which dwells upon the industrial Resources of Gujarat, I would like to draw attention to some of the important points.

First of all, I would like to point out that I have depicted the conditions of the industries as prevailing in 1937-38. That means, I have represented the pre-war conditions of these industries. I have thus dealt with the (*i*) financial, (*ii*) marketing, and (*iii*) the various other problems which they were facing in those days. The war period is an abnormal one, and, cannot be taken into account for studying the conditions of the industries which are going to outlive that period. When, therefore, the normal conditions are restored, most of our readings will regain their value. All the prices mentioned in my readings are therefore, the pre-war prices.

In my work, I have made use of the 1931 Census Volumes ; for, (*i*) I have studied the conditions as prevailing in 1937–38, and (*ii*) the 1941 Census Volumes for all the Gujarat areas are not available as yet.

In my readings I find that according to 1931 Census 82,752 persons were employed in the Registered Textile Factories including the Textile Mills, while actually as great a number as 1,03,148 is employed only in the Textile Mills of Gujarat in 1937–38.

This is partly due to the progress made by the textile mill industry during the course of the six or seven years, and, partly due to the defective method and practice of enumeration of Census details. Such defects are also noticed by Mr. N. M. Joshi in his Urban Handicrafts of the Bombay Deccan. From his actual survey Mr. Joshi found the census figures 'exaggerated in some respects and underestimated in others'.

Under the circumstances I have given the grand figure of the total number of workers under the main heads of occupations as worked out from the census figures. But, for the individual industry, as far as possible, I have given the actual figure (or my estimate) which I consider to be more helpful in this connection. Such estimates or figures are worked out by me by preparing the directories of individual concerns and artisans of the centres I visited. When possible, more information about the adjoining territories was also noted by me.

However, I do realise that I have not been able to do proper justice to the only important large scale industry of Gujarat *viz.* the textile mill industry ; while for the want of regular industrial census, some oversight, as regards the size of a few cottage industries is bound to occur in my work· For this, I have simply to acknowledge my limitations.

In connection with the textile industry the Bombay Economic and Industrial Survey Committee have suggested that "between small scale and cottage industries.........no regulation is necessary, except in the case of the textile industry, where the growth of small powerloom factories needs be restrained".

But I defer from this their suggestion. The powerloom factories in my opinion are the textile mills in miniature. For these factories, situated in the small towns of Gujarat, their owners keep the accounts, sell the goods, and supervise the labour. They produce goods for which there is a local market. Labour is also comparatively cheap in these district towns of Gujarat as compared to the cities like Ahmedabad or Baroda. Moreover, these small powerloom factories' owners are able to avoid all overhead expenditure (incurred in the payment to the Directors of the Mills for every Board of Directors meeting), and also much of the commission and transport charges which the Managing Agents of the textile mills have to incur. All the evils of the Managing Agency System are thus conspicuous by their absence in case of the powerloom factories. Due to these reasons, it is reported that in Japan this industry has shown greater signs of decentralization.

These factories purchase mill yarn, hence, for their yarn (their principal raw material) they have to depend upon the spinning mills. But they will and do compete with the textile mills in the rates of the cotton piece goods. They are successfully able to withstand the textile mill competition, especially in the production of 'khans' (bodice cloth) and also saris ; and perhaps ultimately the production of these goods might become their entire monopoly.

As for the production of the 'dhotars', as they are produced in thousands, more economy can be effected by their large scale production. But the patterns and designs of saris need be changed every now and then after a small lot, hence, they are produced in hundreds. For their production, therefore, powerlooms have an upper hand in the market.

In the end,.I would like to point out that in my findings of the existing conditions of the various industries of Gujarat, the rate of 'kathir' (lead), quoted by the Dahod bangle-makers is too high. I do feel that these bangle-makers use lead and zinc or tin alloy in making these bangles. This appears to be their trade secret, and I hope to throw more light on this point while revising this work in near future. I have also obtained valuable information about the preparation of the tin and the lac colours, from Sankheda artisans, and, I propose to insert this information in the revised work. I also intend to do more justice to the miscellaneous industries dealt with in the Chapter XII of this book. I hope that the material presented in this work will be of great help to the State in devising the Post-War Reconstruction Programme for Gujarat. If my efforts be of service in this direction I shall find my labour amply rewarded.

Lastly I would like to acknowledge my indebtedness to Sjt. Markandrai Balvantrai Mehta, of Messrs. W. T. Jones, Share and Stock-brokers. But for his keen interest in my work it would not have been possible for me to publish this work so soon. In this connection, I am also indebted to Sjt. Dasharathlal R. Joshi, Sjt. Dolarray C. Oza, and, Sjt. Mohanlal T. Parikh, for encouraging me to publish this work at such an early date.

I am also indebted to the Bombay University for allowing me to incorporate in this work the material from my articles, viz. (*i*) The Gold Thread Industry of Surat, (*ii*) The Silk Weaving Industry of Surat, and (*iii*) The Washers Manufacturing Industry of Gujarat, which appeared in the Journals of the University of Bombay.

I am also happy to note that in publishing this work financial help is given to me by the bussinessmen of Gujarat.

Birla College, Pilani, A. B. TRIVEDI
August 1943.

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PART I

ECONOMIC RESOURCES

CHAPTER I

GEOGRAPHICAL BACKGROUND

Location:—Gujarat proper or 'Mul Gujarat' lies on the west coast of India between 20.3 to 24.5 north latitudes and 71.3 to 74.4 east longitudes.

Boundaries:—On the west of the Province is the Arabian Sea and the Nal Kantha (separating Gujarat and Kathiawar); on the north-west is the gulf of Cutch; to the north lie the little 'Ran' (Ran of Thal Parkar) and the Mevad desert; to the north-east Abu and other outliers of the Aravali range. The east is guarded and limited by rough forest land rugged in the north with side spurs of the Vindhyas, more open towards the central natural highway from Baroda to Rutlam, and southwards again rising and roughening into the northern off shoots from the main range of the Satpudas. The southern limit of Gujarat according to popular traditions is the small river Daman Ganga, near the Portuguese possession of Daman*. This area consists very largely of rich alluvial plains.

Area:—The Province has an area of 33798 square miles, with a length from north to south of about 280 miles and a breadth from east to west varying from 50 to 150 miles.

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*Chhe dakshin dishmā Karant rakshā Kunteshwar Mahādeo, (that is, the South of Gujarat God Kunteshwar is protecting). However, Gazetteer of the Bombay Presidency Volume I, Part 1, 'History of Gujarat' mentions that Gujarat's 'southern limit is uncertain'. History somewhat doubtfully places it at the Tapti. Language carries Gujarat about a hundred miles further to Bulsar and Pardi, where wild forest covered hills from the north end of the Sahyadri range stretch west almost to the sea. This observation of the Government adds definite weight to the recent agitation of the prominent leaders of Gujarat including Sjt. K. M. Munshi, that on linguistic basis Gujarat will now cover within her range more territory; and Chinchani, Tarapore and other coastal areas will fall within the province of Gujarat.

The topography of Gujarat has often led people to use for it the simile of the 'sloping roof' ('Padāliyu Chhāparu'). Even though located on the mainland, Gujarat's easy access to the rest of India is cut off by the presence of desert (Thal Parkar) for some length in the north, and, by the hills and the mountains covered with forests on the rest of her boundary lines. All the big rivers of Gujarat flow from east to west and meet the Gulf of Cambay.

Mountains:—Though most of the border line of Gujarat is covered with the hills of the mountains, most of these hills are the ending portions of the mountains which are outside the territories of Gujarat.

The Abu Hills to the north of Gujarat rise at places 5600 feet above the sea level. They are famous for the Jain Temples (built by 'Vastupāl-Tejpāl'), the Palace of King Bhartruhari, the charms of the Lake Nakhi, etc. These hills are a health resort for many people from Gujarat as well as other parts of India. The major portion of the Abu Hills, however, falls within the range of the adjoining Rajputana territory. A little further to the north of the province is the mountain of Arasur about 100 miles in length. It is a vast stretch of hills going right upto the eastern territory of Gujarat. This mountain is famous for the temple of the Goddess Amba Bhavani. Her devotees from all parts of India visit it as pilgrims, and its income is the main source of revenue to the Ranas of the Danta State. This mountain is also famous for its marble quarries.

In the east is the mountain of Pāvāgadh about 2500 feet above sea level and 26 miles in circumference. This mountain is famous for its historical fortress and the temple of the Goddess Kali. Then there are the Rajpipla Hills better known as the Satpuda Hills famous for their agate quarries. Lastly on the eastern side we find the Parnera mountain within the Surat District.

In the extreme south of Gujarat we trace the hills of the Sahyadri mountains stretching themselves towards Gujarat and covering about 100 miles of its territories. Major portion of the Sahyadri Hills, however, falls within the range of the Deccan. These hills falling within the range of Gujarat are thickly covered by groves of trees, and they add a great deal to the forest resources of Gujarat.

Rivers:—The plains of Gujarat stand first in the Bombay Presidency for richness of soil and density of population. Her soil is watered by the big rivers like the Banas, the Saraswati, the Sabarmati, the Mahi, the Narbada, the Tapi, and the small rivers like Viswamitri, the Dhadhar, the Kim, the Purna, the Auranga, the Daman Ganga, and as for the small strimulets they are found in large number carrying the monsoon waters to the Gulf of Cambay. Such strimulets are Rupen, Gomati, Kobri, Sipu, Umardashi, Joyan, Balaram, Labdi, Hathamati, Meshwo, Majum, Shedhi, Vatrak, Mini, Surya, Jambua, Oran, Heran, Uch, Midhola, Vengania, Dev, Nandoli (Karjan or Karganga), Madhuvati, Kaveri, Umravati, Tokri, Shukali, Dhamani, Dhir, Brahmani, Kharedo, Chandrahas, Bhundvo, etc., etc. This is not an exhaustive list of these small rivers, which are simply carrying monsoon waters to the Gulf of Cambay. But the list gives us a good idea about the possibilities of making use of the flood waters. As long as no such scheme is worked out, which can render these waters useful to agriculture, the rich soil of Gujarat shall remain increasingly dependent upon the vagaries of Nature.

As the eastern border of Gujarat is guarded or demarcated by the hilly regions, almost all her rivers flow from east to west to the Gulf of Cambay. Upper Gujarat or the North Gujarat is watered by her main rivers, the Banas, the Saraswati, the Rupen and the Sabarmati and other small rivers. These rivers trace their origin from the Aravali Hills and flow towards the 'Ran' of Cutch. Most of the regions through which they flow are sandy. Even though the Banas is about 150 miles in length and the Saraswati about 180 miles, they go dry in summer. Another river more useful to this region, and the bigger and the longest river of northern Gujarat, is the Sabarmati. Rising from the Aravali Hills it flows towards the south-east of the province and meets the Gulf of Cambay after covering about 200 miles' distance. This river is also joined by numerous strimulets and small rivers, most important of which is the Hathamati. It flows through a deep channel and its banks are very precipitous during its upper course. The stream is for the most part shallow and sluggish. Its bed, about fifty miles from the mouth of the river, is 1550 ft. wide with a stream of about 375 ft. broad in fair season. A noteworthy feature of the river is the formations, by its frequently varying currents, of tracts of mud deposit known as 'Bhāthā'. This forms the most fertile soil for agricultural purposes.

It should be pointed out that in ancient times the Saraswati was considered to be a very important river in this region. With its seven tributaries (all independently meeting the river Indus in the island days of Kathiawar) it played a predominant role in the economy of Gujarat. North Gujarat was more fertile in those days and it being navigable upto a considerable distance from its mouth, helped a great deal in developing the trade of Gujarat. But with the recurrent geological upheavals and earthquakes, it has been practically the "lost river"*, to this region. Its tributaries have dried up, the stream has suffered, and it no longer bears testimony to its former position.

Middle Gujarat is watered by big rivers like the Mahi,

**Vide* Sjt. Ratnamanirao Bhimrao's article on the 'Lost River' ('Khovaeli Nadi') from Prasthan's Samvat 1980 Kartik issue—page 18.

the Narbada and the Tapi, and a number of small streams. The Mahi traces its origin from the hills of Malwa (outside Gujarat) and flows to the Gulf of Cambay. After the Narbada and the Tapi, it is the largest of the Gujarat rivers. It crosses about 320 miles distance in Gujarat before reaching the Gulf of Cambay. Like the Sabarmati it flows in a broad and deep channel between banks at places more than 100 ft. high. Hence at times it is known as the 'Mahi Sagar', particularly in times of floods when water flows with the velocity of 75 lakhs of cu. ft. in a second. This river separates Kaira District on the right from the Panch Mahals and the Baroda Territory on the left. In by-gone days it was navigable upto a considerable distance from its mouth. It has, however, suffered much from the movements in the earth's crusts and does not enjoy her former glory of being useful and instrumental in developing the trade of this region.

The river Narbada is the biggest river of Gujarat. It traces its origin in the Amarkantak Hills of the Vindhyachala Mountains in the Bilaspur District of the Central Provinces. Before meeting the Gulf of Cambay it flows to the east to about 750 miles; however, for about 500 miles its course is between the Vindhya Range on the right and the Satpuda Hills on the left. Its course across Gujarat before it meets the Gulf of Cambay is about 100 miles. In Gujarat, it passes through the Broach District, and, through out this section of its course the Narbada moves through the rich, flat plains between high rough banks of hardened mud and sand. The breadth of the river varies, but near the town of Broach, it is about a mile. The river is navigable upto 65 miles* from its mouth. Even though deep and broad, the configuration of the banks makes it increasingly difficult to dig the channels and direct the water to agriculture from this river; hence, well thought out schemes which can render this river more useful to agriculture in Gujarat are urgently required.

**Vide* Surat and Broach Gazetteer. p. 344.

The river Tapi takes its rise in the Satpuda Mountains and flows to the east to about 420 miles, and crossing the alluvial plains of the Surat District it enters the Gulf of Cambay through a narrow passage known as the Haranfal. It is navigable upto 20 to 30 miles from its mouth.

The Lower Gujarat or the South Gujarat is watered by various small rivers and streams. During the monsoon they become torrents, and in the hot weather (in summer) they get completely dried up. Among these strimulets, the most important are the river Purna, the Ambika, the Auranga, the Par, the Kolak and the Daman Ganga.

The Gujarat rivers are deep with high banks and hence are not suitable for the purpose of constructing canals for irrigation. Relief of the land (the gradual slope of land from the east to the west) renders it still more difficult to utilise the floodwaters for agricultural purposes; and the difficulties of digging the canals for irrigation purposes hang heavily upon the minds of her engineers. Not only will this solve the scarcity problem in case of failure of rain, but, the necessity of such shemes will be realised when it is understood that these floods to-day work havoc in Gujarat. They cause tremendous damage to the cultivation and property of the people even resulting in the loss of lives of men and cattle. The Sabarmati, the Mahi, and the Narbada are equally liable to floods*.

Floods:—As the years roll on, the danger from floods is gaining in momentum in Gujarat. The authorities concerned should, therefore, move in this matter and take all the necessary steps to mitigate this evil. Of the several courses the most prominent is the silting of the Gulf of Cambay. As all the Gujarat rivers flow into the Gulf, there has been a

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******Vide* Statistical Abstract Bombay Presidency 1925.**

rise in the bed levels of these rivers, consequently during floods more and more upward banks are broken by the waters. They overflow the adjoining territories, drain away human and cattle wealth and destroy crops, huts, cottages and houses. To add to this adverse work of Nature, the railways which are constructed on a slightly higher level in Gujarat, have disturbed the natural drainage of the country. The old drainage lines have been silted up by the encroachment of the sea on the coastal villages of Broach, while the opening of the new drainage lines in the Gaekwad's territories is responsible for bringing more water into Gujarat*.

Lakes:—The soil, the ultimate source of production, requires water and warmth to be assured for the growth of plant life. If, therefore, the rivers cannot meet the requirements of the region and it remains dependent upon the uncertainty of rain, construction of lakes for storing fresh water for irrigation purposes can afford a ray of hope to the agriculturist. In this the topography of Gujarat, however, comes in the way. Almost all the mountainous regions are on the Eastern Border of Gujarat and the mainland is gradually having a slope towards the west—the Gulf of Cambay. Big water reservoirs, or irrigation tanks can only be constructed at an immense cost. Such cost can be repaid over centuries and not over decades. Hence, we find near almost every important village of Gujarat small tanks which go dry in summer; mud water of these tanks quench the thirst of the cattle, while some small lakes are maintained and purposely constructed to meet the water demands of the towns or villages. Both these varieties, therefore, in no way serve directly the needs of agriculture. Among such small tanks and reservoirs meeting water requirements of cattle and men are the following:—1. Sankeshwar, Kunwar, Sami, Munjpur and Saran within the Radhanpur State; 2. Manas

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* *Vide* Sir F. Lely's Evidence before the Irrigation Commission, 1904 Part IV, p. 78. Especially Report of the Irrigation Commission 1904, Part II, p. 48.

Sarovar at Palanpur; 3. Madla, Nareshwar, Naida, Shaban, Gangadia within Cambay State; of which Madla supplies water to the Cambay town; 4. Rani Ramaleshwar, Babsar, Jumasar, Ambaras, Karma and Pratap Sagar within the Idar State. There are many such small tanks in each and every Gujarat State, but, being not so useful, their proper record is not preserved. 5. Rajpipla State Administration Reports mention "small tanks are there, here and there, in the State territory but they go dry in summer." 6. While the Baroda State, well reputed for the preservation of statistics, gives the following information about the tanks within its Territories in Gujarat.

Table giving the Tanks within the Baroda State territories in Gujarat*.

Mahal	No. of Tanks	Mahal	No. of Tanks
Patan	817	Baroda Prant (Sub-divided into Petlad, Padra, Baroda, Dabhoi, Sankheda Savli, Karjan, Sinor and Vaghadia Mahals—and Bhadran and Tilakwada Peta Mahals) ...	2,965
Sidhpur	383		
Kalol	394		
Kadi	968		
Chansma	358		
Mehsana	171	Navsari Prant (Sub-divided into Navsari, Vyara, Kamrej, Songadh, Mangrol, Mahuwa, Gandevi and Palsana Mahals) ...	692
Kheralu	274		
Visnagar	165		
Harij (Peta Mahal) ...	157		
Antarsuba (Peta Mahal)	66	Grand Total ...	7,410

The above table about the Baroda State territories should not mislead us. Most of these small reservoirs go dry soon after the monsoon is over. As for the British Districts of Gujarat no proper record of such small lakes is preserved, not even the small irrigation tanks which were built at various places in Gujarat in the past have been properly looked after*. The carelessness of the authorities in this direction cannot be overlooked. They ought to have shown better reason and properly maintained these small reservoirs in a province where irrigation projects are difficult to lay down.

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*Vide Geography of the Baroda State (Vadodra Rajyani Bhugol)—Baroda State Education Department's publication (1940).

Some small canals are constructed in a few states but they are either meant for diverting additional waters to the tanks which are meeting the requirements of the capital towns or important towns in their territories. Thus *Scot Canal* in Radhanpur State about 9 miles in length serves as a source of additional water supply to Radhanpur talao; Bilia Canal, a small canal in this state dug in samvat 1856 (year 1799–1800) near the village of Orumana does meet some requirement of agriculture, while we are given to understand that there are good possibilities of converting Loteshwar's big ditch into a lake. In the same way, Hathamti Canal (Naher) in Idar State also serves some useful purpose. But no important canal or irrigation dam watering thousands of miles of land is available in Gujarat. The province needs the engineers who can achieve this even in face of the handicaps which its physiography presents and the necessary outlook of the State to initiate and finance such schemes.

Climatic Conditions:—The province being only 20.3 north of the equator, it is bound to be intense as regards its climate; more so, when it is realised that this is a small country near the equator and the Tropic of Cancer passes through the northern border of this region. However, the Arabian Sea and the Gulf of Cambay which wash the western coast of Gujarat reduce the temperature and render the climate more plesant and healthy. Another redeeming feature provided by the relief of this land is the presence of the rugged mountains and hills of the eastern boundary which are thickly covered by groves of trees. They also help to reduce the intensity of climate.

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*In Ankleshwar Taluka so many small irrigation tanks have been wiped out of existence because of the neglect of the authorities to repair them in time.

Because of the above factors on the western coast line of Gujarat, the climate is moist, while on the eastern boundary, it is comparatively cold. In the extreme north of Gujarat, in the 'Ran' or the desert of Thal Parkar, and, the round about region, the climate is dry. Dryness causes the climate of this part of Gujarat to be one of extremes, that is very hot in summer and very cool in winter. In the central Gujarat the climate is less moist and comparatively severe in intensity*.

Gujarat's climate is acknowledged on all hands to be "Monsoon Climate." By the monsoon climate is meant the existence of the cool season with little rain from November to January, the hot season from March to June, and rainy season from June to October. This type is often known as "Summer rain's Climate" for the rainfall occurs in the summer of the year. During winter Gujarat is very pleasant. There are variations in different parts of the province, and the inland areas are often covered by frost in the months of January and February. The fog and the frost, as well as the dewfall which form at daybreak are more common in the interior than on the coast, and, they are dispelled by the sun at about nine in the morning. They are not unhealthy. The hot weather (summer season) begins in April and lasts until the rainfall which occurs by about the middle of June. The months of May, June and July are hot because the Sun's rays fall vertically near the Tropic of Cancer which passes through the northern border of Gujarat. The plain

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*For further information and statistics about climate *vide* Dr. B. N. Desai's article, "Has the Climate of Gujarat Changed During the Last Sixty Years? No." from the Journal of the Gujarat Research Society, October 1941 issue, Vol. III, No. 4, pages 212-228.

of Northern India which is situated near it, is greatly heated. Hence, North Gujarat is the hottest region in summer, as the air when heated expands and its pressure decreases. But the Indian Ocean, a little south of the equator, is comparatively cooler, and the air above it is also colder and heavier than the air of the plain of Northern India and the territories of the North Gujarat. It, sherefore, blows towards the heated plains of Northern India. After crossing the equator it is deflected towards the east and becomes the South West Monsoon. As it passes over thousands of miles of the ocean it is saturated with moisture. It blows over Gujarat from June to October.

Rainfall:—Thus the rainfall of Gujarat is chiefly derived from the South-West Monsoon from June to October. From the Southern Sahyadri mountains the monsoon passes through the Narbada Valley and causes a rainfall of 60 inches at Chhota Nagpur. However, that part of the Arabian monsoon which passess over Rajputana goes straight to the Himalayas without shedding a single drop of rain on the plain of Gujarat. The reason is that the central plain of Gujarat is very hot and level, and, there is no mountain to check this monsoon. The Aravali Hills which form the nothern end of this plain, however, receive about 60 inches of rain. It will thus be realised that the South Gujarat covered with the hills of the Sahyadri and the forests of Dangs receives more rain than any other part of Gujarat. The rainfall here varies from 60″ to 100″. The Narbada Valley due to the attraction of the Satpuda mountains receives rains from 40″ to 50″ while as we reach the northern region of this province rainfall is declining. It being 35″ to 40″ round the regions of the Sabarmati and the Mahi, while Banas Kantha records from 0″ to 20″. This is the average recorded by taking the rainfall of decades into consideration. If no mountain is there to attract the clouds in Central Gujarat (or in the plains of Gujarat) at least afforestation or the plantation of trees might help in this direction. Table No. 1 in the Appendix gives the rainfall figures of last ten years for the different parts of Gujarat. It clearly brings out one striking feature about the rainfall occurrence in Gujarat which has of late made itself more conspicuous throughout India. It is the uncertainty of rainfall, or, in other words greater discrepancy between the rainfall figures of the same place for consequent years. This can be arrested by adopting afforestation policy. Otherwise, it becomes difficult for the peasants to judge as to what crops should be cultivated in a particular year, or when to water the land as the rain withholds*. Our discussion about the location, the geographical position and the relief of this province, will not be complete till some aspects of its Coast have been brought to the forefront.

COASTLINE, HARBOURS AND PORTS:

Gujarat proper was once gifted with 250 miles of coastline. In the hey days of the country crafts and the small boats, this is, in the pre-era of the steam engine and especially in the island days of Kathiawar, we have ample testimony to prove that Nature was more favourable to the people of this province. This 'Garden of India', (or 'Nandanvan' as Gujarat was known and is known today)

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*In this connection *vide* Dr. B. N. Desai's article 'Has the Climate of Gujarat Changed During the Last Sixty Years? No.' from Gujarat Research Society's Journal, Vol. III, No. 4, October 1941 issue, pages 236-248. Therein Dr. Desai states "from the foregoing account of rainfall at the Gujarat Observatories during the last 40 to 60 years, it will be seen that there are variations from year to year in the date of advance of monsoon, and, in the amounts of rainfall in the monsoon and non-monsoon months. There does not, however, appear any systematic change in the rainfall over Gujarat during the last 60 years. Years of scanty or large rainfall occur at intervals and sometimes a number of lean years may be followed by a number of years of more than normal or abundant rainfall and vice versa" *vide* page 241. Another phenomena, he mentions, is the occurrence of frost in Gujarat. "In any long series of years one finds spells of a few years when frosts are more frequent than usual but they are only temporary and irregular both in length and occurrence. *Vide* page 244.

had enough outlets to form connection with overseas centres. Every creek afforded such an outlet, and the whole coastline was broken open by the mouths of the numerous streams and rivers, meeting the Gulf of Cambay.

However, the recurrent geological upheavals mitigated and minimised the importance of its sea-board. About 50 to 70 miles of coast in the extreme north went dry, and, except in the rainy season we now find Kathiawar and Gujarat joined by the land for all practical purposes. This is the result of the change in course of the river Indus that once flowed via Lahore to the Arabian Sea, separating the island of Kathiawar (present Peninsular Gujarat) from the mainland (or 'Mul Gujarat').

The far-reaching effects of these upheavals are brought home to us when we cast a casual glance that now only 160 miles of coastline affords a sea-outlet to the people of this province. Moreover, the process of silting has rendered the mouths of many of its rivers non-navigable (which means now various creeks are useless for the purposes of over-seas communications).

At the outset let us make it clear that the coast of Gujarat is very little indented, and, it is low, sandy, and flat. The sea around it is shallow ; hence, it claims no good harbours where big ships can safely anchor. When, therefore, the mouths of many small rivers of Gujarat were affected by the process of silting, it became difficult for even small boats to ply in them. However, in these shallow seas and creeks fish are abundant and fishing is carried on extensively. To the importance of these creeks as fishing centres we shall refer under the heading 'Marine Resources of Gujarat,' which we propose to take up a little later. Here we want to concentrate our attention upon the importance of the coastline to its trade and commerce.

The Ports of Cambay, Broach and Surat have played important historic role in developing the commerce and trade of Gujarat, but they were found useless for the big steam-ships or the big ocean-liners to anchor. They were of little utility to the traffic now to be handled by these huge ships. Their importance, as the channels of transport to cater for the needs of the upper India markets suffered a great deal, with the railway construction and at their cost the new port of Bombay (that was later on developed by the Government of India) gained in importance.

Cambay, Broach and Surat were thus good ports upto the 16th century when traffic was carried in small vessels and their harbours were not silted up to the present extent. These ports to which history pays glorious tributes, were humming with busy life in ancient times when even the internal markets of Gujarat were not developed and were not so important. But with the changes in the geological beds its constant upheavals brought about the processes of sea shifting and of the silting up of the mouths of the creeks as the river Indus changed her course and the river Saraswati was lost to Gujarat during these upheavals. The gross negligence in the upkeep of these ports at this critical juncture, by the authorities concerned, needs to be highly deplored. The above facts were first brought to the notice of the Government of India by the Ratnagiri District Co-operative Conference who passed the resolution in 1935 pointing out to the Government of India the economic importance of the water transport. "Transport by water is cheaper than transport by land. It, therefore, helps the agriculturists a great deal in making it possible for them to sell goods in a long distance market at an advantage, and also, to get their necessaries at cheaper rates." This Conference also pointed out to the Government that 'goods used to be carried on in Gujarat and elsewhere on an extensive scale in former days by water transport'. But 'owing to the silting up of the creeks, these creeks were rendered useless for transport purposes. They, therefore, appealed the

Government of India to explore all the possible avenues for the further development and improvements of the ports and road-steads." Thus the curtain over the dark history of the Gujarat Ports was for the first time lifted by the Ratnagiri District Co-operative Conference in 1935 and subsequently the Bombay Minor Ports Committee was appointed by the Government of India in the light of the above recommendations. It should, however, be pointed out that the Bombay Minor Ports Committee have referred to the minor ports of Cambay, Broach, Surat and Bulsar, while the road-steads of Gujarat still remain neglected and uncared for. Moreover, if the steam-engine gave the Steam Ship with large tonnage to the world to develop its commerce, it also supplied a means in the Railways to open up and cater for the internal markets. The construction of railways in Gujarat required the building of bridges and dams, and this construction of bridges and dams have also adversely affected the drainage scheme of the province. "The railways, which are constructed on a slightly higher level, have disturbed the natural drainage of the country. The old drainage lines have been silted up by the encroachment of the sea on the coastal villages of Broach."* The existing conditions of the minor ports of Gujarat viz. of Cambay, Broach, Surat and Bulsar cannot be presented in a better way than in the light of the findings of the Bombay Minor Ports Committee. In the opinion of the Committee their conditions are almost identical.

PRESENT CONDITIONS OF GUJARAT'S MINOR PORTS AND CREEKS

Cambay suffers from the silting of the mouth of the river Mahi. The Mahi often piles up mud hills near her mouth which changes the course of the water. Hence the size of the vessels visiting Cambay is hardly 300 tons and they are required to be of a shallow draft for the purpose of sitting on the mud if necessary at any time. There is one dangerous place called the Bore Rock between Magarvalli and Cambay of which the ships have to take care.

**Vide* Sir F. Lely's Evidence before the Irrigation Commission 1904.

Broach which is on the bank of the Narbada is 30 miles in the interior from the mouth of the river. There are several large shoals and sand banks, particularly at Samni and Kukerwada which render the river unnavigable except at high spring tides. The port is practically open for about 15 days in a month and is closed to traffic during the monsoon when there are floods in the river. Vessels of 100 tons come up to Broach at high spring tides and those upto 80 tons can easily ply upto Broach at ordinary spring tides. The mouth of the river which is near Lohara is also silting up. Since the construction of the new bridge the current of water running down to the gulf has changed its cource towards Broach and is causing erosion on the northern bank. The depth of water at the anchorage in front of the Customs House has, therefore, increased.

Surat is only seven miles from the mouth of the river Tapi. There are sand banks at a few places in the Tapi between Dumas-Hajira at the mouth, and, the Hope Bridge in the town. Vessels of 50 tons burthen come up the river upto Surat at the daily high tides. The river is sufficiently wide and deep near the anchorage opposite to the Castle.

Bulsar is only about 3 miles from the sea. There are small sand banks at only two places between the mouth of the river and the town. Vessels of 50 tons can enter the river at high tide on any day; but those of larger tonnage can come in at spring tides only. Erosion is noticeable on the southern bank near Hanuman Bhagda—Bulsar; and, to prevent further erosion seven groynes have been constructed out of the Ports Fund between the Customs House and Hanuman Bhagda.

SEVERAL SUGGESTIONS TO INCREASE THE UTILITY OF THESE PORTS AND CREEKS

Realising the precarious condition rendered by the utter negligence of the authorities concerned, the Bombay Minor Ports Committee have made various useful recommendations pertaining to Broach, Surat and Bulsar ports which deserve our special attention.

Broach. As for this port, there is an urgent need for the construction of a covered high level shed (godown) for storage of goods brought for shipment or for removal into the town. The urgency of this measure will be brought home when we point out that at present goods have to be landed and shipped as quickly as possible in order to enable the vessels to sail before the end of the spring tide. It often so happens that it is not possible to procure enough conveyances to remove the goods to the town or to bring the goods for shipment. They have, therefore, to be left on the vacant ground by the side of the Bandar Road. As this area is covered with water at high tide the goods at times get damaged. Hence an open high level shed, covered at the top, with a gradual slope from road level to the base of the shed, should be provided for, near Becharaji Ovara.

Another suggestion coming from a different quarter also deserves our attention. The Collector of Broach has suggested that the existing road from the Bandar passing through the town to the Railway Station should be widened and improved for the development of the trade of Broach.

In Surat Creek the following shoals are either extensive or rocky, they, therefore, should be marked with wooden stakes, viz. shoals near (1) Umra (2) Magdalla (3) Gaviar (4) Dumas (5) Hajira and (6) Mora.

As for *Surat Port* in addition to the marking of the creek at various points as mentioned above with wooden stakes, there is a necessity to construct groynes at suitable points to prevent erosion on the Surat side of the river. Though the erosion does not lead to siltation in the river, nor does it affect the jetties, there is a fear that it might divert the course of water to the other bank and cause siltation near the jetty. This precautionary measure, therefore, requires to be taken.

Besides this, the necessity for the construction of a new jetty and a landing place, or, the extension of the existing facilities, is felt on all hands. At present at Surat Port hardly 10 to 12 vessels can load and unload at a time in the busy season. The jetty which is recently constructed can hardly accommodate 6 vessels at a time; and, the existing wooden jetties are in a dilapidated condition and therefore useless. One of them needs renewal in order to provide accommodation for 6 more vessels; and in view of the strong current of water in the river and danger from floods, a floating jetty (Thapda) which can be removed in the rains will better suit the purpose.

Further the bank being precipitous great hardship is experienced by labourers in loading timber. There is, therefore, a need for a separate wooden slipway for shipment of timber. A ship with a correct gradient to ensure timber sliding down at all states of the tide will remove this inconvenience.

As Chapat Bandar Road is maintained out of the Ports Fund and is repaired every year, another useful suggestion in this connection is of removing the mud, accumulated on the road during the rainy season, soon after the monsoon is over. This will lessen much of the inconvenience caused to the traffic when such repairs are delayed and attended upon late in winter. Finally, for Surat Creek, we suggest the Conservator of the Port to remove and mark the uprooted trees hidden in the creek-bed.

THE BULSAR PORT AND CREEK

In Bulsar Creek the four sand banks between Kosamba and Bulsar require to be marked with wooden stakes.

Marking of shoals or rocks by means of stakes requires small cost, and, hence deserves the immediate attention of the authorities concerned.

The landing place or the wharf at Bulsar cannot be used at low tide for shipment and landing of goods, and, carts have to pass through mud to get to the vessels' side in the stream. Therefore, a jetty or other suitable landing facility is required at Bulsar. It is, therefore, desirable to metal or asphalt the 'Kachha' slip and to see that the mud accumulated on its surface during the rainy season is cleared up every year as soon as the monsoon is over.

Another suggestion is about filling the pit in the road going through the creek. This will be accomplished at a very small cost and will result in a great deal of convenience to the traffic.

Finally, owing to the change in the course of water at the mouth of the river, the light at Kosamba does not serve as a guide to masters of vessels. This light should, therefore, be removed to Bhagal side (to a more suitable site) after consulting the nautical adviser.

It is to be regretted that up till now no attention has been devoted to study the existing conditions of the road-steads in Gujarat. What is their present importance to the Gujarat economy, how to enhance their utility and such other querries can be answered only after a scientific inquiry into the matter. Gujarat, being favoured with so many small creeks, is likely to benefit much from such an inquiry as it might unfold good possibilities of utilising some of them with greater advantage. These neglected road-steads have been at present the good fishing centres of Gujarat. Thus, Sarod, Kavi, Tankara, Jambusar, Sajod, Hansot, Bhagwa, Maroli, Navsari, Matwad, Dandi, etc., are the centres where fishing is carried out on a good scale today. We have noted this while studying the condition of fishing industry of Gujarat in Part II of this book. It is, however, necessary for us to find out as to what part the Minor Ports of Gujarat play as the channel of transport today, and, what was their position in former days in this connection.

As regards the present importance of the Minor Ports of Gujarat the following table gives some idea.

Table giving the sea-borne trade of the Minor Ports of Gujarat For the Year 1936–1937.*

Ports	Imports Value in 000s Rupees	Exports Value in 000s Rupees	Total Sea-Borne Trade Value in 000s Rupees
Cambay ...	7,80	9,53	17,33
Broach ...	39,06	48,71	87,77
Surat ...	29,73	10,79	40,52
Bulsar ...	11,71	7,96	19,67
Total ...	88,30	76,99	165,29

(*N. B.* Table No. II in the Appendix gives import and export trade figures for the years 1932–33 to 1936–37 while Table No. III gives the figures of the total sea-borne trade of the above centres during the same period.)

As can be seen from the above table, total sea-borne trade of these ports was Rs. 1,65,29,000 in 1936–37 of which imports accounted for Rs. 88,30,000 and exports for Rs. 76,99,000.

The importance of Gujarat Ports has definitely dwindled as will be realised from the fact that the ports of Cambay and Surat handled cargoes far more greater in value as well as quantities in the by-gone days. Thus

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* Figures taken from Bombay Minor Ports Committee Report.

Cambay's *(Year 1806)	Total Imports from Madras and Bombay	Total Exports to Madras and Bombay
	Rs. 3,26,27,403	Rs. 3,61,05,080

Thus even when statistics of Cambay's sea-borne trade with only the Indian ports are available, they give us the total of Rs. 6,87,32,483 in the year 1806! Compare this figure to the present total trade of Cambay of Rs. 17,33,000 (in 1936-37), and just imagine as to what a prosperous town Cambay must have been in the past.† Having thus realised its importance, we would like to refer to the Surat Port and its economic importance to the hinterland of Gujarat in the past.

Surat and its adjacent villages' §(Year 1806)	Total Imports from Fort St. George and Bombay	Total Exports to Fort St. George and Bombay
	Rs. 1,40,88,743	Rs. 86,51,615

Compare these figures of the total sea-borne trade of Surat with other parts of India of Rs. 2,27,40,358 in 1806, with the total sea-borne trade of Surat of Rs. 40,52,000 in 1936-37! Moreover, the above figure of the year 1806 does not give the correct idea about the sea-borne trade of Surat for that year, as the figures of the value of goods exported to the Gulfs of Persia and Arabia during 1806 are not available to us.

Moreover, decline in the importance of Surat's port had already set in before 1806. Mr. William Milburn in his *Oriental Commerce* while making mention of this year says 'the commerce carried on at Surat is stated to have declined

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*For further information refer to "Oriental Commerce" Volume the First by William Milburn, Esq. of the Honourable East India Company 1813—p. 155.

†Table No. IV in the Appendix gives figures of sea-borne trade of Cambay for 1802-1806.

§Table No. V in the Appendix gives figures of sea-borne trade of Surat for 1802-1806 and Table No. VI gives figures of exports from Surat to the Gulfs of Persia and Arabia for four years 1794-95 to 1797-98.

COLLEGE

since the establishment of Company's power in it. A considerable part has no doubt been transferred to Bombay '. * Thus it is well-nigh impossible to restore the ports of Gujarat to their former position. However, if properly looked after they can still render very useful service to the trade and commerce of this province.

The study of the coast line of Gujarat has finally given us a good perspective about the relief of the land; moreover, our study of the minor ports made it conspicuous to us that the Bombay Minor Ports Committee omitted the recommendations regarding the Cambay Port in their findings. It is so because, this Port happens to be under the jurisdiction of the Nawab of Cambay. The province of Gujarat claims to-day the existence of something like 200 odd different jurisdictions within its fold. These small and odd divisions have been coming in the way of evolving a common economic policy for the whole province. They strangle the growth of economic activity in this land and yet their existence cannot be overlooked.

HISTORICAL, POLITICAL AND NATURAL DIVISIONS OF GUJARAT.

The Ancient History of Gujarat bears ample evidence that once this province was ruled by two great Kings and their dynasties. The Northern Gujarat was known in those days as " Anartta " and the Southern Gujarat as " Lata ".

" Anartta " was the land extending from Abu upto the right bank of the river Mahi, while the " Lata " was the land extending from the left bank of the Mahi upto the right bank of the river Tapi.

The Capital of Anartta was Anandapura or Vadnagar. It was known as ' Chamatkarpura ' in the First Yuga or ' Satyuga ', Anarttapura in the Second Yuga or " Dwapar yuga ", Anandpura in the Third Yuga or ' Treta Yuga '. and, Vridha-nagara or Vadnagar in the Fourth Yuga or

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* *Vide* page 161.

'Kali Yuga'. As regards the Capital of 'Lata' much controversy is raised and we refuse to be dragged into that controversy here. It is, however, interesting to note that the Kings of 'Lata' were constantly trying to extend their sphere of influence further South; that is, towards the other (left) bank of the Tapi. They could succeed in this by making Kings on that side to acknowledge them as overlords at the point of their swords, or by executing public works, like rest-houses, almhouses, gardens, wells, etc. in the further South. The history of the Kshatrapas of Gujarat gives ample evidence to our contention.* Various dynasties ruled Gujarat later on, chief among which were the Traikutakas, the Guptas, the Valabhis, the Chalukyas, the Gurjjars, the Rashtrakutas, the Mihirs or Mers, the Chavdas, the Chaulukyas or Solankis, and the Vaghelas, in the early history of Gujarat. Then followed the Muslim period, the Maratha period and the regime of the East India Company. It is needless here to go into further details about the history of Gujarat, but, it is important to note that with the passage of time there arose different kingdoms in Gujarat in succession as mentioned above. These kings used to sub-divide their territories among their sons, or kiths and kins, and, hence, something like 198 small territorial divisions, had taken place which the British Government, (the Government of India) when they took over the charge from the East India Company tried to group together for administrative purposes. †

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* *Vide* Gazetteer of the Bombay Presidency History of Gujarat Volume I, Part I, Western Kshatrapas A. D. 70—348, pages 23-53.

† Banas Kantha Agency States	24
Cambay	1
Mahi Kantha Agency	106
Reva Kantha Agency	61
Surat States (Bansda, Dharampur, Sachin)	3
Narukot	1
Baroda	1
British Districts	1
	198 different jurisdictions.

A few big States, a number of small States, and the existence of many petty States in Gujarat made it increasingly difficult for the Government of India to devise a common plan. Added to this, the territories of the British Government and of the Baroda State lay scattered all over Gujarat interspersing the territories of other States, each of which claimed special rights and privileges guaranteed to it by the East India Company.

For the Administrative convenience, therefore, they grouped these States as follows :

POLITICAL DIVISIONS OF GUJARAT.

The district engulfing the northern portion of Gujarat including Palanpur and Radhanpur were put under the supervision of the Palanpur Political Superintendent (viz. Banas Kantha Agency with 24 States and other petty estates)*.

The territory immediately below this Agency consisting of 59 territorial divisions and 47 small estates was termed the Mahi Kantha Agency the region being nearer to the river Mahi. However, neither the Banas Kantha Agency signified the territory upto the right bank of the Banas nor the Mahi Kantha meant that the river Mahi watered the region or political division after which it was known ! For the Mahi is a bit away from this division. Mr. Mount Stuart Elphinstone in his Minute dated the 28th February 1821 writes: " It is scarcely necessary to mention that the fiscal and military division known by thy name of Mahi Kantha is not, as that name implies, confined to the banks of the Mahi, but extends northward from that river to the Banas, a distance of 120 miles, and includes all the part of Gujarat which requires the presence of a military force to procure the payment of the Gaikwar tribute, that is, all the north or north-eastern portion of the province ". This statement clearly signifies that the Government of India made these divisions purely from the points of view of military and fiscal considerations.

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* Forming the part of Western India States Agency.

Cambay enjoying a special privileged position in this part was put under the control of the Political Agent of Kaira.

Below the Mahi Kantha Agency was again formed a group of 6 large states and 55 small states under an Agency known as the Reva Kantha Agency roughly stretching from the Kaira District (British Area) upto the river Tapi including 'an irregular band of territory'.

Added to this under the Surat Political Agent were the three states of Surat viz. Bansda, Dharampur and Sachin; while Narukot in the south-east of the Panch-Mahals was administered by the Agent to the Governor in Panch-Mahals.

For Baroda State, however, a special Resident was appointed who was instructed to correspond with and take his orders from the Government of Bombay instead of the Government of India*.

And, finally, we have to allude to the British Districts of Gujarat (viz. Ahmedabad, Kaira, Broach, Panch-Mahals and Surat) which were directly under the control and supervision of the Bombay Government.

These political divisions were not the final ones and every now and then shuffling and re-shuffling of the territories was taking place in order to suit the requirements of a particular period, or the expediency of the times. Even we find that Kaira and Panch Mahals which were grouped together in the beginning were separated afterwards and so were the Surat and Broach; and Panch Mahals later on is joined with Broach for administrative purposes under the

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*** After 1857 Mutiny, Lieutenant Colonel Wallace was appointed the British Resident at Baroda in August 1859. In this connection. *Vide* Gazetteer of the Bombay Presidency Volume VII, Baroda, page 275.**

same collectorate. It will serve no useful purpose to go into the details about this political grouping and re-grouping of the territories in Gujarat, but it will be interesting to note that upto about 1933 we find no important change in these divisions.

However, with the rise in the wave of nationalism in 1930, which culminated in the holding of the three Round Table Conferences, it was decided to effect a change in the administrative policy of the Government of India. The Federal Form of Government visualised in the Act of 1935 demanded the States joining the Federation to send their representatives to the Federal Legislature. Hence the rights and the privileges of the various States (joining the federation or otherwise), their relations with the Government of India, their status, etc. were being hotly discussed and a sort of re-adjustment was being arrived at by re-grouping all these States once again for the administrative convenience.

RECENT POLITICAL DIVISIONS.

(*1*) *Under the Western India States Agency.* We find the following territories of Gujarat :—Tharad, Wao, Warahi (Malek Shri Jorawar Khan's), Radhanpur, the whole of the Banas Kantha Agency, and added to it, Ghodasar, Idar, Ilol, Katosan, Mansa, Mohanpur, Ranasan, Varsoda, etc., etc*.

(*2*) *Under the Western Rajputana States Residency* are grouped Danta and Palanpur.

(*3*) *Under the Gujarat States Agency and Baroda Residency* are mentioned all the remaining States of Gujarat.

Added to these, there are the (*4*) *British Districts of Gujarat.* It is really shocking to note that for political

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*** On the 1st April 1933, certain other States including Idar and Vijaynagar were added to the Western India States Agency, while Palanpur was transferred to the Rajputana Agency. *Vide* Memoranda on the Indian States 1937–page 288. For further information *vide* Appendix A, at the end of this Chapter, on the Government of India Notification of April 1933.**

considerations, mainly based upon the rights and privileges or the status of the States concerned, Danta and Palanpur are grouped under Rajputana Agency. Even a lay man will wonder and inquire whether in the making of federal India this sort of divisions be tolerated? Neither language nor geographical location can allow us to put these territories under Rajputana. But herein it has got to be remembered that the States concerned and the Government of India both are to be jointly blamed and held responsible for these unnatural measures which might give rise to many more complications in future. These States, thinking that when the federation is inaugurated, Rajputana States, having glorious history to support them, will be enjoying better status at the hands of the Government of India, carried on agitation for grouping them under the Western Rajputana States Residency. History, nearness of that Residency, relationship, political expediency, etc., etc., were their pleas and ultimately they succeeded in their claim! While at Danta the Naib Dewan R. P. Kanhare tried to convince and persuade us that Danta was not in Gujarat. He was also insisting that we should prepare a Geography that can uphold his contention. However, when inquired about the geographical location of the Temple of 'Amba Mata' (which happens to be the place of pilgrimage for the Gujaratis, and hence, the main source of income to the Danta State), he wanted the temple to remain in Gujarat and the rest of the territory to be placed under Rajputana. This is only one of the examples where we find individual considerations predominating over all other considerations.

So many different jurisdictions, which develop the cross currents of political economic interests, definitely choke the growth of economic activity, and, Gujarat has to thank her history in this connection. We, the students of geography, can never tolerate the existence of so many walls (in the shape of small territorial divisions under different jurisdictions) operating against the socio-political unity and the economic uplift of the masses of Gujarat. Her potential resources, we can definitely predict, are marking time, and unless better political atmosphere prevails in this region, her people shall lead a poor standard of living than what the Nature has ordained for them. Looking to her topography the most reasonable, scientific or natural regions of Gujarat are the following :—

NATURAL REGIONS OF GUJARAT.

North Gujarat or Upper Gujarat

Her relief makes the existence of the rivers very conspicuous. Hence, the region from the Noithern Hills of Aravali to the right bank of the river Sabarmati can be conveniently called the North Gujarat or the Upper Gujarat.

Middle Gujarat or Central Gujarat

The region stretching from the left bank of the Sabarmati flanking up to the right bank of the Tapi be termed Middle Gujarat or the Central Gujarat.

the *South Gujarat or Lower Gujarat*

The region extending from the left bank of the Tapi, watered by the small rivers like the Purna, the Ambika, the Auranga, the Par and the Daman Ganga, be called the South or the Lower Gujarat. The convenience rendered by the rivers in grouping the areas of Gujarat need not be underrated nor be overlooked. They naturally suit the requirements of common features, like similar characteristics of soil, vegetation, climate, plant life and animal life.

Even if the small divisions are required (though we ourselves do not favour such ideas at all), the other rivers be taken into consideration. The regions thus made available will be (1) the Banas Kantha (2) The Sabarkantha (3) The Mahikantha (4) The Narbada or the Reva Kantha (5) The Tapi Valley and (6) The Daman Valley regions.

We definitely maintain that no sane person will ever brook the idea of spliting up the Banas Kantha Agency solely with the view of putting Palanpur under Rajputana Residency. Palanpur and Danta are the States within the province of Gujarat and will remain the part and parcel of this territory. It would have been better if economic expediency or social ties, rather than political considerations, would have weighed more with our ruling authorities before arriving at this decision. The culminating or the resultant evils of this measure arising from the separationist tendencies will have greater repurcussions upon the social outlook of the people of this region. It can be easily maintained that Gujarat deserves expert minds at the helm of the affairs to handle the situations arising during this critical period in her history.

Leaving aside the problems of the divisions of Gujarat, it is now desirable to have a purview of the natural resources which this Economic Background has laid at her disposal.

APPENDIX A.

Government of India, Foreign and Political Dapartment Notification No. 137—I, dated 1st April 1933*.

WHEREAS the States specified in the first column of Schedule I annexed hereto have, with effect from this 1st day of April 1933, been transferred from the Agency within which they were theretofore included and included in the Agency created in this behalf and specified in the corresponding entry in the second column thereof, or as the case may be in the pre-existing Agency specified in the corresponding entry in the third column thereof within the political charge of the Agent to the Governor General bearing the designation specified in the corresponding entry in the fourth column thereof, and in certain cases have been included within a political Agency subordinate to such Agent to the Governor General and specified in the corresponding entry in the fifth column thereof;

SCHEDULE I.

1 STATES	2 Newly created Agency in which included	3 Pre-existing Agency in which included	4 Designation of Agent to the Gov. General	5 Subordinate Agency in which included
Agar, Alwa, Amrapur, Anghad, Balasinor, Bansda, Baria, Bhadarwa, Bhilodia, Bihora, Cambay, Chhaliar, Chhota Udepur, Chhorangla, Chudesar Dhamasia alias Vanmala Dharampur, Dhari, Dodka, Dudhpur, Gad-Bariad, Gotardi, Gothda, Itwad, Jambughoda, Jawhar, Jesar, Jiral, Kamsoli, Jumkha,	Gujarat States Agency		Agent to the Governor General for the Gujarat States and Resident at Baroda	

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* Published on pages 230-231 of Government of India Gazette, Part I, dated 1st April 1933.

1 STATES	2 Newly created Agency in which included	3 Pre-existing Agency in which included	4 Designation of Agent to the Gov. General	5 Subordinate Agency in which included
Kadana, Kanoda, Kasla Paginu, Muwada, Lunawada, Mandwa, Mevli, Moka, Paginu, Muwada, Nahara, Nalia, Nangam, Naswadi, Palasani, Pandu, Pan Talavdi, Poicha, Raika, Rajpipla, Rajpur, Rampura, Rengan, Sachin, Sanjeli, Sant, Shanor, Sihora, Sindhiapura, Surguna, Uchad, Umetha, Vajiria, Vakhtapur, Varnolmal, Varnol Moti, Varnol Nani, Vasan Sevada, Vasan Virpur, Virampura and Vora.				
Ambliara, Bhalusna, Bolundra, Dabha, Dadhalia, Dedhrota, Deloli, Derol, Gabat, Ghodasar, Hadol, Hapa, Idar, Ijpura, Ilol, Kadoli, Kasalpura, Katosan, Khadal, Khedawada, Likhi, Magodi, Maguna, Malpur, Mansa, Mehmadpura, Mohanpur, Mota, Kothasna, Palaj, Pethapur, Prempur, Punadra, Ramas, Rampura, Ranasan, Ranipura, Rupal, Sathamba, Satlasna, Sudasna, Tajpuri, Tejpura, Timba, Umri, Vaktapur, Valasna, Varsoda, Vijaynagar, Virsoda, Wadagam, Wasna, Bawishi Thana, Vatrak, Kantha Thana.		Western India States Agency	Agent to the Governor General in the States of Western India	Sabar Kantha Agency
Danta and Palanpur.		Rajputana Agency	Agent to the Governor General in Rajputana	Jaipur Residency

CHAPTER II

FORESTS

ABOUT the forest wealth of Gujarat the old records give enough glimpses that formerly Gujarat was richly gifted with thick groves of trees and that she had vast forest resources at her disposal. But with the increase of population the pressure on the timber for fuel increased and the reckless felling of the trees brought about the destruction of many of her rich forests.* If we try to probe a little further in the past, the Geological upheavals of the far-reaching effects also seem to have played havoc in this connection. The river Indus changed her course, with the consequent result that (1) the major portion of Cutch was rendered a desert, and (2) the island of Kathiawar became a peninsula. Added to this, the river Saraswati and her seven tributaries were practically lost to this province during these movements of earth's crusts†. These must, therefore, have definitely contributed their quota to render the climate more intense in North Gujarat.

From the topography of Gujarat it is easy to realise why her Southern and Eastern hilly tracts have got good forest resources. The Southern part of Gujarat receives more rainfall, because, the clouds of the South West Monsoon first dash against the Western Ghats and the Sahyadri Hills causing heavy rainfall in these regions. They then drift towards the Satpuda Hills from where they pass on to the Eastern border of Gujarat, which is a hilly tract.

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* Thus History gives us ample clues as to how this land of 'honey and milk,'–predominantly a pastural and a grassland, known for the huts and the residence of the Shepherds, the Rabāris and the Rajputs, gradually became devoid of forests. Under the circumstances, the nomads of this region had to imbibe the sedentary habits. If, therefore, we find Adverse Nature as the root cause of the destruction of this vast natural wealth of Gujarat, there is enough evidence, that, the growing population of this region resorted to ruthless cutting of the forests for fuel purposes, and, later on State also resorted to the same practice to obtain Timber for the Railways construction.

† *Vide* Ratnamanirao Bhimrao: *Shankhapur in Vadhiar and Nagadharnib near Bhavnagar.*

The South, the South-East and the East Gujarat are, therefore, rich in forest resources. Hence the Navsari Prant (Baroda), the Surat District, and the Bansda, Rajpipla, Jambughoda, Chhota Udepur, Devgad Bariya and Sant States cover up 90 per cent of the forest areas of Gujarat. Gujarat, therefore, is gifted with good forest resources, and, she has good scope for their development. The total forest area of Gujarat is more than 15,00,000 acres. (Appendix A at the end of this Chapter gives figures for the various States and Districts.) Gujarat has, however, the areas of 'poor' forest resources and also of 'good' forest resources; and the definition of forest varies with the different areas of Gujarat. We have, therefore, preferred to study separately the conditions of the existing forests of Gujarat by dividing the whole region into (*i*) North Gujarat, (*ii*) Central Gujarat, and (*iii*) South and East Gujarat.

(I) FORESTS OF NORTH GUJARAT

As for the North Gujarat in the extreme north-west, desert conditions prevail because of the adjoining areas of the 'Ran' of Cutch and 'Thal Parker' which render the climate intense and dry. The remaining territory on the north and north-east is well protected by the hills of the Aravali mountains. Hence the large forests in the north and north east of the Palanpur districts, though at present of little value, will, if well managed, yield a considerable revenue. The Bhils and Kolis gather bees' wax, honey and the pods of the 'cassia fistula', 'garmala' and sell them to Vanias or Memons who dispose them of in the larger towns. A considerable number of cattle are pastured in these forests and still more in the valley of the Banas. The bamboo-woods are in places very fine, especially on the top of the Jasor hill. These areas are, therefore, suitable for bamboo plantation, and, grass lands for improving and encouraging cattle-breeding. Bee Keeping can also well thrive in this zone. It is not so easy to suggest the large scale industries, unless it is found out that raw material viz., the paper-pulp of suitable quality will be available in enough quantity from the bamboos of the Palanpur forests. Other factors about market, transports, finance, etc. have also to be considered. But these handicaps do not prevail us in suggesting the above minor industries and their development. The chief trees available in the forests of Gujarat are enumerated a little later. We are here trying to find out those forest resources of various parts of Gujarat, which are useful for industrial purposes and to see what attempts have been made to develop them. In this connection, the Palanpur State Administration Report for the years 1936–37 and 1937–38 states "the forest land appears well suited for sandal wood plantation and already 2,070 sandal wood trees were thriving in the forest area. In addition to these, some 200 more were planted during the two years under report, which include 58 in the Balaram Jungle."

Radhanpur State (in the north-west of Gujarat, having the 'Ran' of Cutch on its borer, and, being itself a flat plain without any mountain zone) has few forests. Yet there are 1,57,231 acres* cultivable waste lands, in this State. If these areas cannot be taken into cultivation, they can be used for judicious plantation of trees, and converted into forest areas. At present only 19,141, acres area is covered with babuls in this State‡, and the State has at its disposal a number of grass lands (vids) important among which are: 'Porana Vid', 'Amirpura Vid', 'Dharavdi Vid', 'Gochnad Vid', and 'Hariaband Vid.' Enough supply of 'Kadab' and 'Zinzvo' that means, grass is made available by these 'vids' and still there is enough scope to add to these grass lands in order to encourage cattle breeding.

******Vide* Statements published by the State in this connection.

‡*Vide* Radhanpur State Administration Report for the year 1935–36.

(II) FORESTS OF CENTRAL GUJARAT

The Central Gujarat has 'poor' forest resources. Mahi Kantha has no important revenue yielding forests. The hills within this Agency are chiefly covered with bamboos, brushwood, and teak. Except at Esri, where there are some fine teak trees reserved by the Maharaja of Idar, the teak is generally uncared for, and cut down before it grows to any size. The chief forest products are gum and honey.

However, Idar State in this part of the province has good scope to develop its forests. But it has, as yet, not taken proper care to develop this natural wealth. Mr. A. P. Kodaisia, the Revenue Commissioner informed us that medicinal herbs and the soft wood was available within the limits of the State; and that an Ayurvedic Pharmacy or, the Match Industry might be conveniently started at Idar or at some suitable centre in the State. However, in his opinion, enough 'Simal' trees were not available, hence, for the above suggestion about Match Industry, further investigations are a necessity. "But", he added, "the kher trees are available in abundance, they are over matured hence 'katha' making is under consideration."

If the forest produce capable of commercial expoitation is not available in enough quantity (as only ⅓rd of the land of the State is taken into cultivation), the State has enough waste and cultivable land lying idle which can be utilised for plantation purposes.*

Cambay State has no forests while the States of Balasinor and Lunawada have recently begun to evince inrerest in this direction. "For the last seven years the forests are well looked after." The State has created the Forest Department, and, "the forest staff also does the work of planting and rearing mango trees on road sides and on open plots".‡

**Vide* "Geography of the Idar State" by Rajyajoshi Gopaldas Jogidas.

‡*Vide* Balasinor State Administration Report for the year 1936-37.

We thus find that some States are trying to develop their forest resources. However, unless the experts (botanists) are employed who (*a*) can guide them in planting trees, plants and shrubs, after studying the suitability of the climate and soil, (*b*) can select the convenient areas for the plantation of the trees and (*c*) can show them the ways and means as to how to rear better breed plants from the point of view of (*i*) seed (*ii*) manure (*iii*) culture, etc., these measures will be half-hearted, and at times they will result in futility. It is, therefore, essential that the survey of the flora and fauna of Gujarat be immediately taken up in hand by the authorities concerned.

To the Lunawada State the main income of forests is on account of timber and other miscellaneous products such as timru leaves*. But the State is not working any area departmentally. The teakwood and the timru leaves are sold by auction. If the State is selling the forest produce by auction there is every likelihood that the purchaser will be tempted to eke out the best, that is, to cull out as much as possible in order to realise the best for the auction price he has paid. This will result in cutting of many young timber trees, etc. Hence, it is desirable that before every auction sale the forest expert should mark the matured trees and the plants which can be conveniently allowed to be cut off. Unless this precaution is taken, it is impossible to check the harmful effect of auction sale.

The Lunawada State Administration Report‡ also mentions that "every facility is given to the people for cutting and storing grass on payment of a nominal royalty. No grazing fees are charged from the agriculturists for grazing their cattle in the Kharaba lands". But, in our observations from the major part of Gujarat, we have found, that it is more or less customary with the States concerned to add up some such statements in their Administration

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* Rs. 93,548 for the year ending 1938.

‡ For the year ending 31st October 1938.

Reports for the sake of public applause. If minutely scrutinized, we find the spirit of the law is broken, and that this happens to be simply an ornamental phrase added in their Reports by the authorities concerned. The result is that enough grassland ('Gauchars') are hardly available for cattle grazing.

British Gujarat covers the greater part of Central Gujarat. Ahmedabad has a few thousand acres classed under forests, but hardly deserving the name; while Kaira has no forests and the same is the case with Broach.

We get some glimpses about the plantations of sandalwood near Dholka and of blackwood near Ahmedabad*. But, as they were neglected, they no longer exist. The district as a whole is open and poorly wooded.

Of the important produces, mention be made of the 'mahura' trees towards Modasa side of the district where the 'doliu' or the Mahura oil forms a favourite article of food with the Bhils and it is also used for making washing soap. Prantij is a famous centre for soap making in this District as Sillicate of soda ('us') as well as mahura trees —the principal raw material required in soap making are available in this Taluka.

Kaira district is generally spoken of as one of the best wooded parts of the Bombay Presidency. This in one sense is true. There are in this district good many shade trees like nim, pipal, banyan, etc., but the district has neither forests, nor forest lands. Notice should, however, be taken of the mango, 'mahura' and the 'rayan' trees of this district. In season, mangoes are exported in considerable quantity to Baroda, Ahmedabad and Kathiawar while 'rayan' forms the staple food of a large section of the Koli population of the district. The season for mangoes, rayans, 'mahura' flowers as well as 'mahura' seeds, is summer. During this hot season 'mahura' flowers are also eaten by the poorer classes and by cattle.

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* Mentioned by the Ahmedabad District Gazetteer in 1879.

Broach district is equally devoid of forests. However, in the South of the district 'tad' and 'khajuri' trees are available in abundance.*

Likewise the Gujarat States which happen to be in the centre of the province have little forest wealth. There are no forests within the territories of the States of Mansa and Ilol. As regards the Baroda State (in the widely scattered areas of this principal State of Gujarat covering more than 1/5 of Gujarat's territory), we find a few jungles in the Mehsana Prant near Dehgam and Antar Suba Mahal (Sub-division), some forests in the Baroda Prant (10,859 acres), while mainly it is the southern territory of this State—the Navsari Prant—which is richly endowed with forests (3,15,980 acres).

Baroda State has its own Forest Department looking after the upkeep as well as the management of the forest areas. It will be interesting here to note that the past records, give ample evidence that, once Navsari forests covered somthing like 600 sq. miles area† (3,84,000 acres). Hence in this division there is a decrease in forests area by about 68,200 acres. Moreover, the tasar silk-worm rearing was also the minor produce† of the Navsari forests.

But, going through the present literature about the forests of the Baroda State, it seems that the silk-worm rearing is totally neglected by the authorities concerned, and the same is the case with the sandalwood trees which used to once occupy prominent position in the Kadi Division of this State.§ It, therefore, appears that the lack of proper care has resulted to a greater extent in the extinction of the sandalwood as well as the cocoons, from among the minor forest produce of the State.

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* Mr. C. G. Gandhi, Vice President, District Local Board, Broach suggested the possibility of Gur making from the products of these trees.

† *Vide* Gazetteer of the Bombay Presidency Volume VII, Baroda, p. 39,

§ In the Vijapur sub-division, the Gazetteer of the Bombay Presidency Volume VII, Baroda, mentions that the sandalwood trees were planted and were available in good numbre. *Vide* pages 41-42.

Once the Sankheda side of the Baroda territory was greatly covered over with forests.* Here, therefore, is an area where efforts for afforestation will give better results. Sankheda, Vyara and Navsari tracts of the State receive more rain than other areas, hence, plantation will be more successful in these zones. For the Sankheda Mahal, there is an urgent need for additional forest wealth, as will be easily realised from the following statement concerning this Mahal.‡ There is an increase of 39.2 per cent offences during this year. This increase is mostly due to a large number of offences in Gir and Sankheda ranges under the class 'unauthorised grazing' owing to the drought condition. A large number of offences under the class "unauthorised fellings" were more petty pilferings. Enough clue is provided by the above incidents, that there is an urgent necessity for adding to the timber and grass resources of this Mahal, and also to make them available to the public.

(III) FORESTS OF SOUTH AND EAST GUJARAT

Coming to the South Gujarat, we find, in the eastern part of the Surat District, scattered in small areas, some forest tracts, in Chikli, Bulsar and Pardi talukas and the Valod Peta Mahal. Teak is the very important item of the Surat forests, and it is very fine when it grows on the flatter areas, while if on the hills, it is rather poor in quality. Some soft woods are also found in these forests, while among their minor produce are bamboos, 'timburni' leaves from which 'bidis' are made, 'harda' fruits, etc. However, it is for the toddy-yielding wild date tree or 'khajuri' that Surat was once very famous, and is even known to-day. Besides the wild date, toddy is drawn from the brab or tad, a common tree in most parts of Surat. But with the view of diminishing the consumption of spiritous liquors, many trees of both varieties were destroyed in numbers by order of the Government by about 1853*. We do not approve the Government policy of destroying the trees. If the public is making bad use of the forest wealth, if the making of spirituous liquors is harmful, other avenues shold be explored for the better uses of the trees. Or else, added efforts should be made to grow valuable trees. But the destruction of the existing trees definitely reduces the forest wealth and renders the area dry and the climate intense. There was a change in the Government policy a little later and the Government of Bombay tried to manufacture Sugar out of the juice of the wild date tree, but, commercially it was not so paying‡. This experiment, therefore, failed.

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* "The north, east and south of Sankheda were formerly forests, of which traces remain in teak and other coppice. *Vide* Gazetteer of the Bombay Presidency Volume VII, Baroda. p. 40.

‡ *Vide* Baroda State Administration Report for the year 1939-40. page 162.

It will not be out of point to suggest here that it is high time when the cost analysis of the plantations of the valuable trees as well as fruit trees be made available to the

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*For further information *vide* Gazetteer of the Bombay Presidency Volume II, Surat and Broach, page 39.

‡It would be interesting here to note the following extract from the Gazetteer of the Bombay Presidency, Volume II, Surat and Broach :—"With the double object of introducing a new industry, and, of checking the manufacture of liquor, the Government of Bombay in 1874 (November 25) authorized the Collector of Surat to spend a sum of Rs. 1500 in an attempt to introduce the Bengal System of Manufacturing Sugar from the juice of the wild date tree. Skilled workmen brought from Jessor, in Bengal, succeeded in making Sugar of a marketable value. But the return of the first set of experiments shows that the juice of a date tree which, sold as toddy, brings in a yearly profit of Rs. 1-8-0, would it manufactured into sugar yield only Rs. 0-10-0. The experiments have been repeated, and the results may be more satisfactory. But so far (1876) there would seem to be little reason to expect that the manufacture of sugar will take the place of the manufacture of toddy. *Vide*, page, 41.

poor, and, illiterate peasants. If reliable and trustworthy statistics and all relevant information be laid at the disposal of the agriculturists, and guidance is given to them as for what particular plantations the soils of their lands are suitable (or more favourable), they will surely get added impetus for taking to plantations of trees.*

The only part of the district, where there is any considerable area of land suited for the forests, is a rough hilly tract in the east and north east of the Mandvi sub-division. Therefore, greater attention should be given to develop the forests in this direction as plantation is bound to yield a good revenue.

Among the thick groves of trees (in the Gujarat's forests) are found valuable trees† like 'teak' ('sag'), yellow wood (haldarvo), redwood ('ratānjalo'), blackwood ('sisam'), 'kher', simal, dhāvdā, tanachh, 'beeyo', 'sādado', 'dudhiyā', etc., etc.‡ Bamboos are available in dense forests. But they are classed under minor produce together with firewood and grass, honey, wax, colouring bark, medicinal herbs, etc.

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*It would, in this connection, be worthwhile to note that the Superintendent of Revenue Survey to the Bombay Government in 1876 noted: "an ordinary sized tamarind tree will, in an average season, yield four hundred pounds weight of fruit. But on account of the dangerous nature of the work, the men engaged in collecting the pods have to be paid as much as annas 8 a day. Cultivators, therefore, generally prefer to dispose of the crop by contract".

If this was the case about 65 years ago, still the same condition prevails as regards the collection of the tamarind pods. Better methods have got to be adopted in this connection, and expert guidance to be sought. How more advanced countries are handling these problems? What is required to be done in this connection? All this information should be supplied to the cultivators.

†The important (1) Shade trees and (2) Fruit trees of Gujarat are the following:—(1) The important shade trees of Gujarat are 'nim' ('limdo'), banyan ('vad'), 'pipal', 'khakharo', 'bili', 'kesudo', 'asopalav', etc., etc. Side by side with these shade trees, other trees commonly observed and important for their minor produce are 'amli' (tamarind), 'mahura' (for flowers and 'doli' seed), 'babul' (lac, gum, etc.), 'gugal' (scented tree), 'khajuri' and 'tad' (palm) (for spirituous liquors), 'timru' (for timru leaves in preparing 'bidis'), 'aduso' (for medicine), 'ghatbor' (for tanning), 'beheda' (for medicine), etc., etc. (2) The important Fruit trees of Gujarat are:—mango ('amba'), 'rayan', 'bordi', 'sitaphal', 'jambudi', 'phanas', 'kel' (plaintains), 'karamada', etc., etc.

‡ From among these trees, 'dudhiyo', 'haldarvo', 'simal', etc., are often classed as soft wood.

In the southern, the south-eastern, and the eastern borders of Gujarat, the forests of Bansda, Dharampur, Rajpipla, Jambughoda, Chhota Udepur, Devgad Bariya, Panch Mahals, and the Sant States are more known for their valuable trees. Here rainfall is heavy and, it being a hilly tract, it is rich in forest wealth.

The Rajpipla State claims the richest and the most extensive forests at its disposal in Gujarat. Almost all the above-mentioned valuable trees are found in abundance in the Rajpipla forests.

The State is gifted with rich grass lands, as well as good quality bamboos, and valuable trees like teak ('sag'), blackwood, ('sisam'), 'tanachh', mango, 'mahura', 'kher', 'bio', 'haldarvo', 'sadado', 'sevan', 'dhavdo', 'rayan', 'tad', (palm), 'khajuri', etc., etc. In addition, Mr. A. D. Bhote, the Forest Officer of the State, informed us that experiments in sandalwood plantations are carried on, and, they afford good hope for success.

A good pharmacy can be started here with advantage, because the forests are rich in medicinal herbs, shrubs, and plants; and they are also favoured with the minor produce like 'pit papdo', 'kado', 'indrajava', musli, etc.* Paper industry can be established in this State for good quality bamboos and grass are available in the Rajpipla forests.*

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*Impressed by the bamboo and grass wealth of the State, Mr. B. Oates in 1929 states, (*vide* his pamphlet on 'A Cursory Examination of the Tertiary Formation in Rajpipla State, and, Its Possible Rescurces') "I would suggest that a profitable industry may be found from the conversion of the State rescurces of grass and bamboos, that is, if these articles are suitable for the purpose I would recommend you (*i.e.* H. H. the Maharana Saheb of Rajpipla) to consult Mr. W. Raitt, the Government Paper Expert, who is at prerent at Dehra Dun", *vide* pages 15-16. Mr. Oates suggested the possibility of having wood pulp and starting paper industry within the Rajpipla State.

The State Distillery makes use of various forest produce, in making wines, while the minor industrial products of the forests, honey, wax, lac, etc.,† are exported outside. These sources can be developed by the State, by hiring the services of the experts.

It is also necessary to remember that excluding even the forests of the feudatory estates, the State has 650 square miles forests of which 425 sq. miles (that means 2,72,000 acres) are covered by reserved and protected forests. Hence, Match Industry can thrive well, if the availability of softwood in enough quantity is guaranteed; and, if the State opens up a Cattle Farm, good bread cattle will be made available, and all the industries, like ghee, butter, cheese, casein, etc., which depend upon milk as raw product, will thrive well within the State.

For the development of the forest wealth and the resultant industries from it, Gujarat can well expect the Rajpipla State to give the lead. In no State in Gujarat the bee-culture is paid attention to, and everywhere the collcetion of honey, wax, and lac are pursued in the crude old manner. Lac refinery (if found commercially a paying proposition) should be started at Rajpipla. Or else, some common plant should be established for refining Rajpipla and Panch Mahals' lac.

The Rajpipla State Administration Report for the year 1934-35 states that the system of management, of opening up reserved and protected areas in strict rotation and selling them by public auction was maintained*.

Here also it should be realised that the 'coupe system' (as it is devised) only guarantees that, in order to maintain forest resources intact, only a small portion will be allowed to be operated every year. But, this system is neither so scientific nor so sound. The trees, the plants, the shrubs and the herbs have their own age to live and then they get over matured and begin to wither. Hence with the help of an expert botanist, it would be desirable to fell every year only ripe or matured trees. These trees should be marked for felling; at the same time during the operations care should be taken that adjoining plants or trees are not damaged. Added to a botanist, a pharmacalogist should be appointed by the State who can popularise all the medicinal herbs and plants, and thus, find ways and means for their utility. Every year the wastage from withering in this direction is enormous; and it has got to be stopped at the earliest opportunity.

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†Vide Rajpipla State Geography by Mr. C. V. Raval, pages 9-10.

**Vide* page 15.

Equally rich in Gujarat are the forests of Panch Mahals on her Eastern Frontier. From these forests every year* "timber, firewood, and 'mahura' flowers are exported to other districts. 'Timru' leaves tarwood bark and 'ghatbor' fruits are also available in these forests". The Divisional Forest Officer Mr. Mirchandani reported that the Panch Mahal forests were rich in good quality timber teak, and, especially in 'simal' trees. The 'simal' trees were over matured and it was a problem to the Forest Department as to how to utilise them. Labour in this part of Gujarat is cheap and softwood of 'simal' trees is also available, hence, if a match works is started here on the basis of Thana and Kurla factories, a new industry will come into existence giving employent to extra hands, and, at the same time solving the marketing problem of these valuable trees. †

"Looking to the medicinal herbs available in our forests, and the exports of some of the known herbs from

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*Vide, Bombay Economic and Industrial Survey Committee Report, Volume II, Broach and Panch Mahals, page 7.

† Mr. Mirchandani showed eagerness to supply the number of 'simal' trees available, as well as the figures of 'mahura' flower and all other minor produce exports, if any industrialist wanted to work out any industry from these produce. He further informed us "Kalol and Halol divisions of this district are also covered with palm trees and if prohibition is enforced, their use for 'gur' making, etc,, should be explored."

Dahod there is a favourable prospect for the development of pharmacy at Dahod" said Mr. P. G. Vanikar, a well known social worker of this district.

The Bhil Seva Mandal in their memorandum, have drawn our special attention to the exports of lac from Dahod.

Considerable quantity of lac is being locally used by the 'Lakharas' of Dahod in making lac bangles. There is, therefore, enough scope for refining lac and making sticks of lac, from the raw lac. This industry can be easily developed at Dahod on cottage basis, and side by side, the steps can be taken to develop the lac resources of the forests.

Mr. Sukhdevbhai Trivedi, President, Dahod Taluka Congress Committee, drew our attention to the abundance of the 'mahura' trees in the Panch Mahal forests. As Dahod is the centre of 'mahura' (flowers, seeds, and oil) exports, soap industry has good chances. In this connection he also pointed out that Dahod was once known for this industry, but at present it is on the verge of extinction, hence, with expert guidance and management better quality soaps shall have to be produced.

Mr. Dahyabhai Naik, the secretray, Bhil Seva Mandal, was of the opinion that bee-keeping, poultry farming, and dairy industries had bright prospects on this side of Gujarat.

Fortunately the station authorities of Dahod have co-operated with us in our efforts to estimate the exports of some of the raw forest produce from Dahod. During the year 1937–38, 18000* maunds of doli oil and 600 maunds of lac were exported from the Dahod station. In connection with lac, the station master remarked that, its exports had decreased for the last two years. If so, the reasons underlying this decrease have got to be investigated, and, the possible measures to improve the conditions should be undertaken. As 800 maunds* of soap is being impotted annually at Dahod (bulk of it is washing soap) it is desirable to export the possibilities of putting this declining local industry on a scientific basis.

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*Figures in Bengali Maunds.

It should be recalled here that Broach and Panch Mahals (practically Panch Mahals) have 2,05,778 square acres of forests, hence, if possible, or whenever necessary if the Rajpipla State Authorities join hands with the Bombay Government, and come to some understanding to provide at cheaper and fixed rates raw products to the enterprenuers desirous of starting industries with the help of this forest wealth, at least the quantity supply of the raw products will be assured.

It is desirable that for the exploitation of forest wealth of their territories the Rajapipla, the Panch Mahals, the Chhota Udepur, the Devgad Bariya, the Jambughoda and the Bansda Governments should join hands.

In Bariya forests valuable trees like 'tanachh' (toughwood used in cart making), 'simal' (soft wood used for match making, and, small boat construction), 'sevan' (light wood used in cart and furniture making), etc., etc. are available. Moreover, physicians visiting Devgad Bariya and Chhota Udepur forests are very much impressed by their medicinal herbs: 'beheda', 'kado', 'indrajava', 'aritha', 'musli', 'pitpapdo', 'gokhru', 'garmala', 'aduso', 'amarvel', etc., etc. are the important minor produce of Bariya forests. Hence Bariya is one of the most suitable centres for establishing pharmaceutical industry in Gujarat.

'Kath' making gives employment to a large number of 'kolis' and 'naikadas' in these forests. Branches of kher tree stripped of their bark are cut into small three or four inch pieces, and, boiled in earthen pots till thick sticky decoction remains. A narrow pit five or six feet deep is dug and a basket containig the extract is placed over the pit's mouth; with the result that (1) the water soaks into the earth, (2) the refuse remains in the basket while, (3) the 'kath' is left in the pit. The extract 'kath' is then taken out of the pit and dried on leaves in the sun.

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*Figures obtained from Dahod Station for the year 1937-38.

Unfortunately, we have not obtained more statistical information about the forests of Chhota Udepur and Bariya States. But, we do hope that these States will adopt all the necessary measures suggested by us to develop their forests wealth, and they will take all possible steps to develop the industries depending upon this forest wealth.

As for the Sant State, (on the estern front of the Gujarat and a mountainous tract), there are many forests within the State territories. They are a valuable asset to the State, but they are not in one compact area. Owing to the inaccessible situation, of some of them and their remoteness from the railway station, there are great draw-backs in realising good prices by their sales. Moreover, as the forests are scattered a large and expensive staff is necessary for their preservation. "However, efforts are being made for putting the forest administration on a better and satisfactory footing"* In these forests, concessions enjoyed by the agriculturists are:—free grazing, free cutting and storing of firewood and grass for their own use, and even for selling them in State limits. The agriculturists obtain the timber and bamboos at specially low rates for building their houses. By these concessions the agriculturists of the State do obtain some relief. But, something more can be done in this connection. The wastelands and the lands lying idle and not taken into cultivation, can be classed as forest areas, and, more grass lands can be made available to these people for cattle grazing, etc.

For the 'kath' industry, just as the Bariya forests, Rajpipla, Panch Mahals and all other forests of Gujarat have a number of 'kher' trees at their disposal. Hence, 'kath' industry has good scope of further development in Gujarat. Even Bansda State forests are covered with a good number of 'kher' trees.*

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* Sant State Administration Report for the year 1937-38.

For cattle breeding we also find that there is an urgent necessity for all the States in Gujarat to leave enough grass lands. We cannot overlook the complaints which we have received in this connection from the States rich in forest resources. They should immediately take up sufficient steps in order to assure good breed cattle in their territories.

Finally, we would like to point to the lack of transport facilities in the east, and especially in the south-eastern zone of Gujarat. It is because of the lack of social contact, resulting from the lack of means of communications, that the rich minerals and forests on this side of Gujarat have as yet been ignored, and, are marking time for their development. Moreover, people on this side are poor, illiterate and backward. The life led by the forest tribes (their manners, customs, economic conditions, etc.), requires a special sociological study.

In some of these areas forced labour prevails while in some of the areas lack of means of communications is so deplorable that practically the people are leading seclusive life of hermits, having no contact with the rest of Gujarat, while the outside capital feels shy because of the autocratic rule of the local chiefs in most of these areas. Some solution has got to be found out, in order that these vast resources be developed. the loss of shrubs, plants, etc. from withering, or the self-extinction of overmatured trees, plants, etc., cannot be tolerated in this era. Experts who can guide in this matter should, therefore, be immediately consulted.

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* At present we are informed by the Karbhari Saheb of Jambughoda that Jambughoda State is evincing keen interest in mango plantations. If these plantations are successful, canning will have a great scope in this State.

APPENDIX A.

Appendix giving the Forest Areas (in Acres) of Gujarat

(It will be realised from the following statements that even when statistical information about the forest resources from the various States covering nearly 74 per cent of the area of Gujarat is collected, it could not be presented more precisely. It is so, because, no attempt is still made to preserve the statistics on a scientific basis, and whatever statistics are maintained by the Gujarat States, they are mostly from the point of view of revenue collection.)

Year	District or State	Area in Acres	Forest Revenue in Rupees
	British Districts of Gujarat :—		
*1936-37	Ahmedabad	9,115	Bombay Economic and Industrial Survey Committee Report gives the Revenue of Panch Mahals Division for 1937-38 at Rs. 2,19, 983
*1936-37	Broach and Panch Mahals	2,05,778	
*1936-37	Surat	46,206	
	Gujarat States :—		
*1936-37	Baroda (Amreli and Okha-Mandal excluded)	3,30,156	
1934-35	Rajpipla (excluding forests in feudatory estates)	4,16,000	2,12,476
*1936-37	Dharampur	91,357	
1935-36	Bansda (Reserved forests only)	55,842	1,43,033
1940	Radhanpur (area covered with babuls)	19,141	
Forests within the above States covering 20593 square miles area of Gujarat.		11,73,595	

***The definition of the term " forests " for these areas is " any land classed or administered as forest under legal enactment dealing with forests ".**

The following States covering 2883 square miles area of Gujarat give the figures of the forest revenues realised by them :—

Year	State	Forest Revenue (in Rupees)	Our estimate of Forest Area of these States (Total in Acres)
1937–38	Palanpur	11,947	
1936–37	Balasinor	16,343	
1938	Lunawada	93,548	
1937–38	Sant State	27,395	
1933–34	Jambughoda (Narukot)	27,021	
Total Forest Revenue of these States covering 2883 square miles area of Gujarat		1,76,254	2,00,000

For the above States, forest areas in acres are not available. In their Administration Reports they simply mention the 'Forest Revenue' realised by them. In order to arrive at the conservative estimate about the forest acreage within these States, we take into consideration the Panch Mahals, Rajpipla and Bansda figures. From the income and acreage figures we find that Bansda State realises double the income in rupees to its forest acreage, while Panch Mahals practically one rupee per acre, and Rajpipla half a rupee per acre. From this point of view, the above States must be covering something like 2,00,000 acres of forests within their territories.

Still we have to make the estimate of the remaining areas. Even though information about the existing conditions of the Idar's forests have been studied carefully, the above tables do not include the forest acreage of that State. In addition, the resources of the Chhota Udepur, Devgad Bariya, and the rest of the Rewa Kantha have to be taken into account. They are likely to increase 2 lakhs acres of the forest areas of Gujarat*.

FOREST ACREAGE IN GUJARAT

STATE OR DISTRICT	AREA IN ACRES
British Gujarat	2,61,099
Baroda	3,30,156
Rajpipla	4,16,000
Dharampur	91,357
Bansda	55,842
Radhanpur	19,141
Palanpur, Balasinor, Lunawada, Sant, Jambughoda	2,00,000
Idar, Chhota Udepur, Devgad Bariya, the rest of Reva Kantha Agency and a portion of the Dangs forests	2,00,000
Total ...	15,73,595

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* Dangs forests are on the border line of Gujarat and practically their entire area (996 square miles = 6,37,440 acres) is covered with forests. When, therefore, the boundaries of Gujarat are extended on the linguistic basis, Gujarat is likely to add a great deal to her forest wealth from this area.

CHAPTER III

MINERALS

As REGARDS the minerals of Gujarat it ought to be pointed out, at the outset, that a proper scientific geological survey of the province is urgently required. An old superfluous record giving very faint indications about the outstanding minerals of Gujarat is available in the volumes of the Gazetteers of the Bombay Presidency. It gives some clue about the availability of certain minerals in the British Districts of Gujarat as well as in the different Gujarat States. But an intensive study from the industrial view point is lacking. We, therefore, welcome the recommendation of the Bombay Economic and Industrial Survey Committee, that the Provincial Governments should take up this matter. In our opinion, if the Bombay Government in collaboration with the Gujarat States, make a comprehensive geological survey of Gujarat areas, from the industrial point of view, it will bring to the lime light many minerals capable of industrial utility; and in holding this opinion we are definitely backed up by the results achieved by some of the Gujarat States in this connection. Baroda and a few other Gujarat States have recently moved in this direction, and, we do hope other States will soon follow their example.

I. PALANPUR STATE : OLD RECORD

For the Palanpur State areas the Gazetteer of the Bombay Presidency states " The rocks are metamorphic, gneiss and mica-schist, with upheavals and outbursts of red and grey granite...There is no lime stone in strata but small lime nodules are found from ten to eighty feet below the surface. Mountain limestone is found in some places, but it does not seem fit for working on any large scale. There is a small limestone quarry at Charanka under Santalpur, where it is sold at 6 maunds per rupee. Granite of good quality is also found, but...it is never quarried...Almost all the building stone of the district comes from the Dhrangadhra quarries in Kathiawar. A coarse marble found at Pānsvāl, Dābhela, Rāmpura, and Juni Vavdi is quarried, and sold at 6 maunds per rupee." Apart from this old record, no further investigations have been made. But the Palanpur State Geography published by the Palanpur Trading Company in 1938 mentions "in the mountains of the State the existence of the precious ores like tin, copper, manganese are traced; while the Mount Jarora side gives the evidence of the existence of Sulphur. Near Amirgadh, the hills of the Diwania are rich in marble stones." It is thus likely that the intensive survey of this region may justify that some ores are capable of commercial exploitation.

II. RADHANPUR STATE : OLD RECORD

Radhanpur territory, however, appears to be poorly equipped with mineral resources. The State Directory, however, mentions 'Sorokhār' is made at Radhanpur, Sami, Munjapur, Kuvar, Naika, Bhilot and Raju. 'Ekvario Khar' made from this 'Sorokhar' is used by the goldsmiths for cleaning their instruments (orjars), while 'Bijivario Khar', which costs Re. 1-12-0 per maund is used for making gun powder. 'Trijivario Khar' costing Rs. 2-8-0 per maund is used for making powder manganese for fire works; while 'Chothivario Khar' costing Rs. 3-12-0 per maund is used for making nitric acid and better quality fireworks. An interesting account, as to how the Bohras of Sami make these 'Khars' and also the fireworks, is given in the State Directory. It is because of the existence of this 'Khar' in the State, that Sami was noted as one of the important centres for making fireworks in by-gone days. It has even to-day maintained some importance in this connection.

RECENT FINDS IN RADHANPUR STATE

It is, however, interesting to note here that in 1919 Mr. B. P. Shah in his Radhanpur State Geography has mentioned "traces of gold are found near Fatehgadh, and that, the sand of the Banas when tested gives the existence of silver and lead particles." However, no further steps have been taken to trace these ores. Added to this, Radhanpur State is very rich in salt resources. It was, once, a great 'Ghasia' salt exporting State. But at the instructions of the Government of India, the State authorities had to close down the Anvarpur Salt Works.

III. CAMBAY STATE: OLD RECORD

About the Cambay State the Gazetteer of the Bombay Presidency notes that within the State territories, " nodular Limestone, 'kankar', mixed with sand or clay is found in large quantities from ten to fifteen feet below the surface. Though not of the best quality, the lime it yields is much used for house-building and other local purposes." No further attempts have recently been made to carry out an intensive survey of the minerals by any agency, hence no other finds are made known to us. But, Mr. J. H. Shah in his 'Geography of the Cambay State' mentions that " the 'agariās' (salt makers) used to prepare 'Ghąsia' salt at Cambay. However, it has now been given up."

IV. MAHIKANTHA AGENCY: OLD RECORD

For the Mahikanta Agency, the Gazetteer reports "no minerals are worked in the Mahikantha. At Ahmednagar, Savgad and Parbada, in the Idar State, a very superior calciferous sandstone is quarried, and it is much used all over Gujarat for ornamental public buildings."*

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*"It was chiefly from the Idar quarries that the mosques and the temples of Ahmedabad were built. The cement was also famous for showing as bright as marble. :In the mountainous country about Idar, there is a quarry of white-stone, which is procurable in no other part. The lime made from this is made in Stucco work, for the walls or terraces of buildings, and for fine edifices, pleasure-houses, and mausoleums. If employed in plastering, it takes so fine a polish as to reflect the light as a looking-glass. When in the reign of Firdaus Ashiani; Shah Jahan, the royal buildings of the citadel of Shahjahanabad (Delhi) were repaired, the lime made from this stone was taken from the Gujarat by the King's Order, and used in their construction. The Mausoleums of the Muhamedan Saints, the temples of the Hindus, and other public works are erected with this lime, as are also numerous canals, water reservoirs, wells and other like buildings." *Bird's-Mirat-i-Ahmadi*, 106.

(I) IDAR STATE: RECENT FINDS

At Betali in Idar, from a dark grey stone, very superior white cement 'chuna', is made...Near Danta, there are some quarries of inferior kind of marble......Talc is found in quantities in the beds of the Hathimati, in the districts of Hapa and Tajpuri, in the Sabar Kantha and at Adpodra in Mohanpur." Up to very recent times very little use was made of these known resources of the Idar State; while others were still marking time for further investigations. However, with the acceptance of the Office by Mr. A. P. Kodaisia, as the Revenue Commissioner of the State, added effort to investigate the mineral finds of the State have been made. As a result in his 'Geography of the Idar State' Mr. G. J. Rajyajoshi in 1939 mentions "In the outskirts of the villages Shivgadh and Motipura good quality stone quarries are worked. The stone is superior to Porbandar Stone, and is exported to Ahmedabad and other centres for building construction. Over and above *China clay* ('Kecholin') is available near Eklara (villages on the banks of the Sabarmati) from which, superior quality cups, saucers and other crockery can be made. At present, however, this clay is exported outside, and no such industrial use is made locally. In the works erected at Eklara and Arsodia, this clay is simply refined and then exported to outside places.

"*Stealite and Asbestos* are also found in considerable areas of this State; and there are all the possibilities of manufacturing slates, pens, toys, etc., from stealite (soapstone) stone, while Asbestos can be used for manufacturing fire-proof materials. Asbestos is most useful for its fire-proof property and, therefore, it is in great demand in this industrial era".

Mr. Kodaisia also stated that *talc* (*French Chalk*) is available in considerable quantity within the territories of this State, and investigations are, at present, carried on in that direction. We hope, that instead of allowing these materials to be exported in raw form, Mr. Kodaisia will be able to persuade the State Authorities to provide necessary guarantees to the outside financiers and enterprenuers in order to induce them to start the possible industries at the suitable places in the Idar State. As long as such favourable atmosphere is not created, capital is bound to feel shy. The Analysis Reports of China Clay, Granite, Talc (French Chalk) etc., which Mr. Kodaisia supplied to us, are given in the Appendix. They prove that these ores are tested and certified by competent authorities as regards their quality. Some of these ores are found to be of superior quality. As far as the *Manganese ore* is concerned, we have still to be cautious. For, first of all, it must be ascertained whether (1) the area, (2) the prospects, and (3) the percentage contents will allow the development of any industry. Failing in this, if the ore is available in sufficient quantity, it may be exported outside.

Crude Soda (*'us'*) used in soap-making and bangles-making is also found near the village Vavdi. The 'us' is made use of in making washing soaps at Himatnagar. It is also used in making 'Bungadio Kach' from which crude glass bangles are made.

(II) ILOL STATE: RECENT FINDS

Even though the Gazetteers of the Bombay Presidency do not mention anything about the Ilol State, in their Administration Report for the year 1931-32, the Ilol State Authorities have stated "In this Taluka *Red, Yellow and White Clays* (*ochres*) are available in good quantities. In the year 1929-30 20 years' monopoly to dig the clay, (with the annual license fee Rs. 30/- and royalty per ton Rs. 0-10-0) has been given to Patel Ratilal Purushottam of Ahmedabad. Moreover, whithin the boundaries of this State very good quality building stones are available. But most of the *Stone Quarries* remain unworked, because of the absence of cheap transports." "If the railway was made available to this State, our Ilol stones would find an easy outlet in Ahmedabad Markets" said Mr. Jethalabhai, the Karbhari of the Ilol State.

(III) BALASINOR STATE: RECENT ATTEMPTS

We find very interesting announcement made by Mr. M. L. Deusker, the Dewan of Balasinor, in the Balasinor State Aministration Report for the year 1936–37. He says "I intend to grant a Prospecting License to a British India Company to enter upon certain pieces of land in this State and carry on necessary operations in the search of limestone, clay, bauxite, and gypsium, in very near future. A mining lease is likewise to be granted. If these operations turn out successful, there will be a good addition to the revenue of the State." The same report also mentions that "good lime is also prepared and exported from this State to outside places." We hope, that proper steps along these lines, will be immediately taken up by the State and the findings of the survey will soon be made available to the public.

(IV) LUNAWADA STATE

Mr. B. C. Gupta, Extra Assistant Superintendent of the Geological Survey of India, visited Lunawada State in 1932–33 and surveyed its south-eastern tracts. It would have been desirable if the State would have induced him to survey all the areas intensively. As for the area he surveyed in 1932–33 he concluded as follows: "There is hardly anything of commercial interest to record so far as the economic minerals of the area are concerned. Besides a few minor instances of ochreous clays in the midst of the Aravali Schists, the only important materials are the slabby building stones."

V. BARODA STATE: RECENT FINDS

About Baroda State we have got various Geological Survey reports at our disposal. Now and often, the State has showed interest in this direction, and hence surveys were undertaken by Mr. R. Bruce Foote in 1891–94, Mr. V. S. Sambasiva Iyer in the early twentieth century, and, thereafter, by Mr. S. G. Narvane, Mr. Sambasiva Iyer, and Messrs. N. D. Daru, H. M. Shah and C. P. Shah.

The Baroda Economic Development Committee have stated in their report that "It would be seen from the physical description of the State that it cannot have rich minerals......Excepting some lime-stones, marbles, granite, china clay, salt deposits, materials for cement and ochres, there is hardly any valuable mineral found so far." The Boroda State Geography published by the Baroda State Educational Department in 1940, have located the places where the above resources are found and it has also made mention about the glass sand, iron-ore, 'us' (crude soda), agate stones and cement stones found within the State territories.

However, from all the geological survey reports of the State concerned, we realise that as regards mineral resources, this State is poor. In the Geology of Baroda State of Mr. R. Bruce Foote as revised by Dr. C. C. Shah in 1938 the same echo is sounded. Dr. Shah says "The results of the various surveys have shown that there is practically speaking total absence of metallic ores and entire want of carbonic deposits within the State. In a country of which the vastly larger part is occupied by great alluvial and subarial flats and in which old crystalline and metamorphic rocks......occupy only a few square miles of space, a great store of gold, silver, copper, lead and other metals is not to be expected. The real wealth of the Baroda State lies in the rich soils which cover by far the larger part of it, and, in the industry of its husbandmen and herdsmen."

Dr. Shah has analysed some of the resources of the State by taking different samples from the different places. To him, resources having greater chances of development are ochres, *China Clay*, *Bauxite*, Quartz Sand, and Basalt rocks. However, he does refer to Breccia, Miliolites and Granites found within the State territories. Agates are found scattered here and there, and at some places large agates are available in small areas. Though traces of iron ore, and copper are found, still investigations have not proved the quantity to be sufficient for commercial exploitation. Dr. Shah has also referred to the Hot Water Springs near Shah and Unai.

Ochres: Red and Yellow Ochres at Ghalha near the junction of the Rhenkhadi with the Tapi, about a mile and a half east of the village and near the pyrites deposit. They are fit for the preparation of light coloured distempers, or for colour washing of walls.

China Clay: A deposit of China Clay is exposed on the right bank of the Sabarmati river, at a point situated about a mile to the S. E. of the village of Virpur. The high quality of the sample from the exposure in the river section and the approximate estimate of its quantity appear to warrant an investigation into the commercial value of this deposit and of any others of a like nature in the neighbourhood. This clay can be used by the textile mills and paper mills. It can be used as a base in the manufacture of pigments, and in the manufacture of ultramarine. The results of analysis are very encouraging, and, as such, if lime is found in the neighbourhood it can be used for the manufacture of cement. It may also be experimented upon for the manufacture of procelain, white-ware, floor and wall tiles, etc.; as also for firebricks and other refractory ware such as glass-pots and crucibles.

Bauxites: There is a small quarry for "white clay" on the south-east base of the low hillock known as "Mataki Tekri" about a furlong to the south-east of the village of Nahani Naroli. The analysis of this clay as well as the bauxite occurring near Kuranga, gives encouraging results. Different grades of bauxite can be utilised for different purposes, such as for preparing aluminium sulphate, alum, alumina, firebricks, or for extracting aluminium.

Clay Ware: At Khari Khadi and Vengan-Khadi, parts of a river to the east of Gandevi, there occurs clay as bedded deposit. It is mottled and streaky-grey, pale lilac-red and yellow. Another deposit of similar clay occurs in Ajrai hill, north of Gandevi, and, is being quarried by the Brick and Tile Factory of Billimora. Similar material is also exposed on the right bank of the river within 100 yards south of the Irish bridge.

The quantity of the clays is sufficient for any large and new concerns intending to utilise these clays found near Gandevi. These clays are worth exploring for Mangalore Tile Industry.

White Clay locally known as 'Bhasma' occurs on the right bank of the Ambika river in the vicinity of the village Kelkach (4 miles to the S. E. of Unai Railway Station). The various uses to which this white sand can be put are glass making, absorbent for decolouring and clarifying oils, manufacture of water glass, for road dressing, for abrasive purposes and refractory purposes.

Quartz Sand suitable for the manufacture of glass occurs in several parts of the State in the following forms :—

(1) In the beds of white and friable locene sandstone with small admixtures of oxide, iron and clay in Vijapur Mahal.

(2) In beds of friable to compact and white, fine to mediumgrained sandstone of Bagh beds, in Songir and Lachharas.

(3) In a loose form as river sand in the beds of the Sabarmati and the Orsang rivers.

Pure sand for the manufacture of glass could be procured from the talus heaps around the various quartzite hills in Sankheda Mahal and from other tracts occupied by quartzites of Champaner age from the pure white quartz found in the Vidwaswami Mata hill east of Sankheda. There is a very large vein of milky white quartz of fairly pure character running northward from the right bank of the Unch river, apparently extending into the Vidwaswami Mata ridge. It is of sufficiently pure quality to be valuable for glass and China making.

Basalt Rocks occur widespread and in great quantity all over the trappoan area. For rough work requiring strength they are well suited and durable. Hundreds of exposures of the rock exist on which quarry work might be advantageously opened.

About Breccia Dr. Shah states " A very beautiful decorative material could be obtained by cutting and polishing the handsome breccia forming some fine crags half a mile to the south of Sandia. There are two varieties: white angular fragments in a red matrix and red inclusions in a white matrix. This extremely hard and desnse silicious breccia would make beautiful slabs and pillars. " However, as regards its commercial exploitation on good scale Dr. Shah has observed silence, hence, this matter requires further investigations. The same is the case with the Miliolites numerous quarries of which have been found near Adivi, Dholassa, Harmaria, etc. In colour texture and structure the specimens from Adivi and Harmaria are very similar to that from Porbandar. The varieties from Dholassa and from Mojap are somewhat inferior as they are courser, and show more open texture, besides containing less of carbonate of calcium and more of insoluble material. A passing reference to the traces of copper are noticed in the granitic rocks of Bodeli and Tandalja, will not be out of place. Dr. Shah states " A closer examination might be made of the rocks of the above parts for the presence of copper ores." It is also said that iron ores were worked in different parts of the State, in former times, but the introduction of cheap iron from Europe has, as in so many other parts of India, completely destroyed the industry, or left it in a moribund condition, notwithstanding the fact that the indigenous smelters turned out iron of excellent quality.

The ores found to have been worked were of three kinds : haematitic, limonitic, and, magnetic, in the order of their imoprtance. The haematite and limonite ores (of the eocene lateritic rocks) were worked formerly on a small scale in the valley of the Sabarmati, traces of which industry are to be seen near Pudhera and at Vijapur, in the northern part of the State, in the shape of small accumulations of iron slag.

The iron industry of Atarsumba in the south-eastern corner of the Mehsana District, which is not yet quite extinct depended similarly on the lateritic haematite occurring just outside the State territory of Kapadvanj, in Kaira District, and smelted there.

Thus in the Baroda State in the northern part of Sankheda Mahal and in the Sabarmati Valley and at Samdhi, smelting was done at a remote period, but at present the industry is totally extinct. The former existence of the industry can be traced by heaps of iron slag which are met here and there. Moreover, immense quantity of rich magnetic iron sand is brought down annually by the Tapi when in flood, and the alluvium locally deposited on the banks of the river is full of it, and so also, the sand banks exposed in the dry season. Dr. Shah, however, sounds a note to the effect that "Even if large quantities of iron ore be discovered by prospecting, it is highly doubtful if it would pay to smelt such ores unless the fuel difficulty is solved. An average sample of the sand from Nimbasoti the most favourable place, contained not more than one percent of magnetite, and hence it would not pay to extract iron from it."

VI. BRITISH GUJARAT: OLD RECORD

If Baroda territory is not rich in mineral ores, the same is the case with the British Districts of Ahmedabad, Kaira, Broach and Surat. However, it should be again realised that, about the British Gujarat only superficial and old record is available. More instensive and comprehensive measures in this direction still remain to be adopted. The Gazetteers inform that in Ahmedabad District "Considerable tracts in Viramgam are covered with earth suited to the manufacture of saltpetre. Coarse soda, 'us', used in soap-making, is found in large quantities in the west of Prāntij. Nodular limestone, 'Kankar', (chhiparā), found in rivers and water courses, and in extensive beds eight miles south-west of Viramgam at the Villages of Kankravadi is used for mortar and in road making."

Just like the Ahmedabad District, the Kaira District is also very poor in the mineral wealth. About the Kaira, it is recorded "some large heaps of iron slag show that at one time iron ore was worked in the neighbourhood of Kapadvanj." With this exception the district is without minerals.

In the bed of the Majam river, (about fifteen miles from Kapadvanj) are found some varieties of agate and moss pebbles. These pebbles known as 'khariyu', 'agiya' and 'ratadiu', when polished, are among the most valued of Cambay stones. In the river Mahi, are masses and builders of trap, and in the east, near where it enters the district, rock is plentiful including trap with occasional limestone, quartz and granite. Though not suitable for building purposes this rock is used for road metal.

Limestone, 'kankar' in small nodules is found in and near most of the Kaira rivers—Mahi, Vatrak and Meshwó, and in the small watercourses. In low broken ground near Kapadvanj, Lasundra, Torna, and other villages in the north-east of the district, white crust of impure carbonate of soda ('us') forms on the surface of the ground. This earth is collected and much used in making glass and soap and as a mordant in dyeing cloth," There are also hot springs at Lasundra 10 miles south-east of Kapadvanj; these are slightly sulphurious and are said to be useful for curing skin diseases.

"With the exception of a conglomerate stone found in Sahol, in the Ankleshwar sub-division, and limestone obtained in Panoli, Samor, and Obha, in the same part of the district, the plain of Broach is destitute of mineral resources." About the Surat District, it is recorded "from the distribution of hills and rocks over so large a portion of its surface, Surat, as compared with Broach, Kaira and Ahmedabad, is well supplied with stone for building purposes. In the Mandvi sub-division at Tadkesar nummulitic limestone, at Majlav calcareous sandstone, and at Nogama laterite, are found. They are used for the metalling and masonry work on a considerable portion of the Kin and Tadkesar road. In the Bardoli sub-division, at Goji and Waghecha, trap can be quarried. In the Olpad sub-division, at Jafrabad, Kosad, and Waracha, nodular limestone or 'kankar' used for metalling roads, can be had. In the Chorasi sub-division from Dumas, Magdala, and Athwa, the city of Surat is generally supplied with sand and nodular limestone. In the Bulsar sub-division trap is quarried at Pardi. Trap gravel is also brought from Wapi. Of these stones, however, the Dungri stone is the most used, especially as metal for the Surat city roads. At Chikhli, in the sub-division of the same name, trap is to be had.

Besides stones for building purposes, iron-stone is the only mineral product of the Surat District. It is found in the Bulsar and the Pardi sub-divisions, as well as Bodhān in the Mandvi sub-division; specimens of slag evidently from native furnaces have been picked up from these areas, but, of the manufacture no traces remain. Metallic sand which accumulates at the mouths of all the rivers when tested gives the purest variety on the Dumas side of the Tapi. But the only use to which it is put, is to serve the purpose of a blotting-paper, for drying up ink.

British Gujarat thus needs proper surveys in this connection. The Bombay Economic and Industrial Survey Committee have stated in their report: "We have gathered the impression that a comprehensive geological survey of all parts of the Province from an industrial point of view still remains to be made, and we see no reason why this should not be undertaken by the Provincial Government."*

Of the British Gujarat even when superflous survey of some parts of the Panch Mahals was made, it gave a clue that it was richly gifted with the mineral resources. However, it is regrettable to note that, as yet, further efforts in this direction have been neglected. An undue delay of about 70 years even with the bright prospects of discovering the mineral finds, cannot be overlooked in this age of industrial civilization. The Gazetteer mentioned "except in its south-west corner, no detailed inquiry into the geology of the Panch Mahals has been made." Still they reported "compared with other Gujarat districts the Panch Mahals are rich in minerals." Their hills contain iron, lead and lac; and only the cost of carriage prevents the use of its stores of building stone. *Iron ore* of considerable richness is found in the Godhra Town and near Jambughoda and Shivrajpur in Narukot. Both in the Panch Mahals and Narukot, though unused for years, traces of old iron smelting works remain. *Lead ore* is found in Narukot, near the iron ore, and at the Khandelav lake two or three miles from Godhra. In 1872 a specimen of the Narukot lead ore was examined by the Government Chemical Analyser. It was reported to be a mass of nearly pure lead with a flintly covering. The lead was a definite chemical compound, with 86.6 per cent of metal. It was, however, poor in silver yielding only five ounces to the ton of lead. Two years later (April 1874) a larger collection of specimens gave an average of 58.91 per cent of metallic lead and very nearly the former small proportion of silver. These results, the Superintendent of the Geological survey thought unpromising, and no attempt has since been made to work the Panch Mahal lead mines.

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* *Vide* their report Volume I, page 17.

"*Talc* (*French chalk*) is found near some of the Narukot hills. But the places are too small to have any commercial value."

"Of stones, sandstone, trap, quartz, coarse granite, basal and limestone, and lime gravel, 'kankar' are found in many parts of the district."

If the above facts were made known to the public in the later half of the nineteenth century by a superfluous survey, it is high time for some renewed efforts to be made in this connection for the discovery of other mineral finds in this zone. Only Shivrajpur Manganese mines are at present worked by Messrs. Killick Nixon & Co., while China Clay is exported from Kalol and no attention is given to the other mineral finds.

VII. JAMBUGHODA STATE: RECENT FINDS

Some of the minerals which were in an unripe state, must have matured by now, while others might be over-matured. Especially, the mica resources of Jambughoda (Narukot) leave the impression that they are over-matured; and, therefore, the decay has set in them, and that, they are fast deteriorating in quality. If these resources remain unworked because this part is backward, and poor, as compared to the other areas of Gujarat, the State should construct adequate transport facilities in order to develop the social contact with outside world, and attract the attention of the rich magnets of Gujarat to these vast sources for investments of their capital.

Mr. C. M. Thakore, Dewan of Jambughoda, laid stress on the needs of developing the transport facilities. The same was the view held by the prominent people of Jambughoda. If the Shivrajpur Railway line is extended upto Bodeli, and, Jambughoda itself becomes a railway station on the same line, its rich mineral ores will soon be worked by the outside capital. Uptilnow, Jambughoda has remained a sort of a 'hermit' State in Gujarat. It is mostly inhabited by the Bhils, a backward tribe. In the Ghanpari and Dandiyapura hills of this State *Lead* is available, in the Jotvad hills *Manganese* is found, and in the Jambughoda hills *Mica* is obtainable. However no proper geological survey is taken of this part, and it being a small State, it might perhaps be hesitating to launch such a scheme of survey. Under the circumstances, various other ores found in the Jambughoda State, remain unanalysed; and it is not at all surprising to note that some of the valuable ores, already on the surface, are washed away every year by the drainage.

The Gazetteer of the Rewa Kantha Agency has also taken the notice of the *Iron and Mica* resources of Jambughoda. The Gazetteer reports "The Rewa Kantha has a considerable store of mineral wealth." Building stone abounds. In the north a rather low class stone is found near the Bariya village of Valundi, and, in the Hadap river; and further north in Sunth, an easily worked bluish stone said to be better than Porbandar, has been much used in Rampur, and in the Chief's palace at Sunth. Slabs of a black, soft and smooth stone found by Bhils and Kolis in Sunth are used by barbers for sharpening their razors; the part of the hill, where they are found is called the barber's hill, 'Gānja ghāti'. Between Vasna and Agar, about twenty-five miles south-east of Chhota Udepur, a whitish sandstone, found in large slabs, would make an excellent paving or building stone. In the south the limestone of the nummulitic rocks is well suited for building. There is also near the centre of the district a good supply of lime, from the metamorphic rocks of Chhota Udepur, and, from the nummulitic rocks in the west. Of ornamental stone the metamorphic rocks near Chhota Udepur yield four kinds of granite: red, white, grey and nearly black, and seven miles north-east of Chhota Udepur good specimens of white, yellow and grey marble have been found." It will thus be realised that no further attempt to discover the mineral finds has as yet been made, except the survey of the outstanding resources of the Rewa Kantha.

The Gazetteer also adds " of minerals near Jabugam on the river about twenty miles west of Chhota Udepur, *Mica* occurs in considerable quantities. *Iron* seems to have once been worked on a large scale along the west limits of the district. Near Jambughoda about twenty miles east of Udepur the ground is so widely covered with slag and scoria as to point to very extensive iron works."

VIII. RAJPIPLA STATE : RECENT FINDS

In the south of the district on the west of the village of Limodra, about twenty-five miles west of Nandod are large moulds of iron slag, evidently from an iron furnace.*

Further south at Bhilod near Ratanpur, some good iron ore has been found, and at Tadkesar to the south of Rajpipla border, piles of iron slag, mark the sites of old furnaces.

" Of precious stones there are the *Agates and Carnelians*, for which since the days of Ptolemy (150 A.D.) Rajpipla is famous." The old Gazetteer thus describes briefly Rajpipla's mineral finds. However, we have received valuable information about the mineral resources of the Rajpipla State. In his 'Rajpipla State Geography' Mr. C. V. Raval also refers to the iron resources of the State. "*Iron ore* is available in abundance in the Valiya Taluka of the State in the outskirts of the villages Dungari and Naldhari. But because of the absence of coal mine near by this ore remains unworked". Moreover, Mr. Raval points out that "Ratanpur's mines of agate stones are of ancient fame. Out of these stones Cambay artisans make buttons, knives, scissors, 'madalias', beads, rings, ear-rings, nose-rings, chains for watches, headware ('chāk'), etc." It would definitely be a more welcome idea if some artisans of Cambay are induced to come over to Rajpipla and establish the repute of the State in preparing these articles of craftmanship. Added to these Mr. Raval alludes to the marble stones, ochres, and slate stones available within the territories of this State. In this connection Rajpipla State engaged Mr. P. N. Bose to carry out detailed survey of the State areas for investigating the minerals. In 1922 in his 'Notes on the Geology and Mineral Resources of the Rajpipla State', Mr. Bose mentions that Carnelian and Agate stones, Iron Ore, Bauxite and Ochres, Limestone, Calcite, Gypsium, Pottery Clay and Building Stones are the main mineral products found within the Rajpipla State.

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* It contained out of 100 parts 53.64 of silica, 5.39 of alumina, 10.49 of lime, 28.96 of the patroxide of iron, and 1.52 loss with traces of magnesia and manganese.

Mr. Bose was totally disgusted with the ways in which mining operations were carried on to work out the *Carnelian Beds*. "Mining is still carried on, as it was when the carnelian beds were first opened up centuries ago. It is, I need hardly say, very unsystematic and wasteful. One or more pits according to the demand are sunk during the cold weather, and as much gravel is extracted from them as is possible, by driving galleries for short distances in various directions. The roofs partially fall inside the pits during the monsoon. When no work is carried on, the old pits become unworkable in the next working season and fresh ones are dug at a safe distance from them. A large quantity of valuable material is thus left unworked.

The amount which has thus been wasted in the past must be enormous." To this remark of Mr. Bose we draw the attention of all the Gujarat States. "If stone quarries or minerals are worked, or the lease is given to work them to the private parties, we have ample proof to indicate that proper steps to systematically exploit those resources have not been taken at all. Consequently, these garnered fruits of Nature have been wantonly handled and it has resulted in a great wastage. If, therefore, any lease to work the mine is given, the State authorities should first see. that proper roofing arrangement is made, modern implements are used, and, expert mining hands are employed in working out these resources. Carelessness in this direction is criminal, as it leaves the posterity poorer in these resources; and once these resources are exhausted, it should be realised, they can never be replaced. All wastes have, therefore, got to be stopped, and these resources have got to be utilised very economically, as far as possible. As for the carnelian beds of the Rajpipla State this sort of precaution would have been a double blessing." "If mining were conducted on modern methods", says Mr. Bose, "not only would all this waste be prevented but it would be possible to carry on operations to much greater depths where carnelian and agate pebbles of larger size and better quality than those extracted at present, are found. The higher value which such stones are expected to fetch will pay for the larger initial outlay of modern mining. The conglomeratic bed just above the most valuable layer of *akik* appeared to me to be firm enough to afford tolerably good roof. Timbering would, however, be necessary to some extent."*

The other mineral ore to which Mr. Bose refers is the *Iron Ore.* "Extensive *moulds* of slags were encountered at various localities, among which Limodra, Bhimpore, Amaljhar and Padvania may be specially noted as being either on or close to the railway line. An idea of the quantity of slags available may be formed from the fact that at Limodra they cover an area of about 6 acres and average 5 feet in thickness.

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* *Vide* "Notes on the Geology and Mineral Resources of the Rajpipal State" by Mr. P. N. Bose, B.Sc. (Lond.), F.G.S., page 16.

The iron ore is of very variable quality. An average sample from Dungri was analysed by Dr. C. Schulten with the following result:—

Oxide of Iron	...	...	73.17
Alumina	...	...	9.26
Silica	...	...	10.68
Lime	...	...	1.20
Water	...	...	4.90
Loss	...	...	0.79
			100.00

This analysis proves the ore to be of good quality, and from the extensive area covered by the laterite a very large quantity of iron ore is expected.

But until workable caking coal is found in or near Gujarat, the question of the regeneration of the now extinct iron industry of Rajpipla cannot be seriously discussed. Hence, the iron ores of Rajpipla are marking time.

In Mr. Bose's opinion besides iron-ore the laterite are likely to yield workable *ore of Aluminium* (*bauxite*). The percentage of alumina found in a sample from Vasna was, however, low (37.51 per cent), but he adds "further investigation may reveal the presence of bauxite with a higher percentage." Extensive moulds of slags were encountered at various localities, by Mr. Bose, and especially among them Limodra, Bhimpore, Amaljhar, and Padvania sites being close to the railway line attracted his special attention. "These are calcareous beds suitable for the manufacture of *Cement*. If actual trial confirms this, enormous quantities of slags are available within the State to be utilised for the manufacture of an artificial stone, known as '*Patent Stone*' now made and largely used in Bengal. An idea of the quantity of slags available may be formed from the fact that at Limodra they cover an area of about 6 acres and average 5 feet in thickness."

Enough *Limestones* are available within the State and some of them near Haripura and Kandh might be suitable for the manufacture of cement.

Though superficial, there is also a fairly large amount of calcite available within the State territories and though Mr. Bose did not obtain any specimen transparent enough, to be of use for optical purposes 'it would' in his opinion, 'yield lime of superior quality.'

There is also a large variety of *Building Stones* in the State. Workable *Marbles* of good quality were met at (1) Gora, (2) Zulta Amba, (3) Vanji, (4) Mokhadi, (5) Sulpan, and (6) Dum Khal.

The deposits near Gora and Mokhadi are favourably situated in regard to river transport, and those near Gora in regard to cart-carriage as well (there being a good cart road from Nandod to Gora).

In addition, "*Quartzitic Sandstones*, well suited for building purpose, as well as, for mill stones, grindstones, etc., are found in all the outcrops of the Bagh beds. The most conveniently accessible occurrences, however, are those near Gora, and Sakhva. There is an old quarry at the latter place".

According to Mr. Bose clays well suited for high class pottery occur in the tertiary beds at numerous places in the Jhagadia and Valia talukas. But, those occurring west of Damlai appeared to be of best quality.

It was this his report on the ochres which attracted great attention of Mr. B. Oates, I.M.E. who in 1929 carried out further investigations into the mineral resources of the Rajpipla State. Mr. Bose stated "red and yellow ochres were found at various places in the Jhagadia and Valia talukas—in the vicinity of Ratanpur, Bhimpore, Padvania, Vasna, etc. Of all these deposits, the best are the red ochres occurring at Padvania. They have been worked for many years past. But mining is carried on in the same unsystematic way as that in vogue for the carnelians deposits." Here again he stresses an urgent necessity of adopting improved methods for the development and exploitation of the potential natural resources. "About 3200 mounds of ochres are annually taken out of the State on pack-bullocks by Mohamedan traders (Banjaras). The royalty paid by them is two annas per maund. A sample of the ochre was analysed with the following result :—

Oxide of Iron	23.80
Alumina	21.30
Lime	2.80
Magnesia	1.70
Silica	35.32
Carbonic Acid and Water ...	14.40
Loss	0.68
	100.00

Mr. Oates was greatly impressed by the Clay resources of the State; as in 1929, in his report, he mentions, "to the west of Damlai white clay's occurrence is of sufficient importance to justify further exploration—it is of excellent quality, and a small sum of money judiciously spent would open up a considerable area." He, however, persists that "all efforts should be concentrated in proving the extension of clays both non-ferruginous and ferruginous in the vicinity of Jhagadia". He suggested "the purchase of boring outfit, which will speedily and economically test the extent and quality of clays" and added that this "boring plant would also be found useful for the testing of probable sources of water supply in the State". Analysis Reports of the various clays by Mr. B. Oates have been given in the Appendix.

In the end we would like to sound a word of precaution that the existence of a main raw product in abundance does not necessarily warrant the erection of a factory. The raw material by itself is only the principal link in a chain, and without remaining links the industry may be doomed to failure.

For example, in the case of any industry, (1) the raw material, its quality and quantity ; (2) coal-suitability and cost ; (3) transportation ; (4) market ; (5) water supply; (6) skilled labour and supervision ; (7) climatic conditions ; (8) terms and facilities offered etc., etc., all these factors have got to be taken into account. We have, therefore, tried to analyse in this Chapter the existing mineral wealth of Gujarat. About their industrial possibilities we have referred to them in Chapter XIII, where we have summarised all the data collected by us and arrived at some definite conclusions.

Mineral ores are likely to be found in the eastern zone of Gujarat, which is a hilly tract. If, therefore, the States like Devgad Bariya and Chhota Udepur make a comprehensive survey of their territories, many minerals capable of industrial exploitation may come into limelight. In the absence of such inquiries for the rest of the region, we find that generally *Stone Quarries* are worked out in different parts of Gujarat, and they supply metal for roads, and, rough stone for building construction. However, they are not of such a good quality as could be exported to outside places with advantage.*

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*Bansda Administration Report for the year 1935-36 states : " There exist a few stone quarries in the State which supply metal for roads and rough stone for buildings. "—*Vide* p. 19.

Similar note, about the working of the Stone Quarries, is made in the Administration Reports of the various States.

CHAPTER IV

AGRICULTURAL AND LIVE-STOCK RESOURCES

SOILS OF GUJARAT

THE total area of Gujarat proper is 21.6 million acres. The soil of Gujarat is mostly alluvial, and, it can be sub-divided into 'Kali' and 'Goradu'.

Kali is the black cotton soil found largely in South Gujarat, in the British Districts of Broach and Surat and the Navsari division of the Baroda State. 'Kali' soil is also found in the Palanpur, Cambay, Bansda (light black), Dharampur (poor in quality), Sachin States, and also in various parts of the Ahmedabad and Kaira districts and the Mahi Kantha Agency.

Goradu soils are characterised by great depth varying from the drift sands of Ahmedabad to the rich loam of Kaira. They contain, to a varying degree, organic matter and we find them in highly developed state in the Charotar and Chauriasi (Baroda State) divisions of Gujarat. Goradu soils are also found in the Palanpur, Lunawada, Balasinor and other States, as well as, in the Broach, Surat and Panch Mahals districts of Gujarat.

There is a third variety known as 'besar', which means mixed soil holding an intermediate position between the above two, found practically all over Gujarat. In the Ahmedabad district there is another variety of soil known as 'Bhatha' formed by the mud deposits of the river Sabarmati; while, the 'Bhatha' soil of the similar characteristics, but, varying in quality, is also found in the Kaira and Broach districts.

The north east of Gujarat especially the tract nearer to the 'Ran' of Cutch gives ample acreage of saltish land ('khār'). Within the Radhanpur State territory, and the territories of the adjoining small States like Bhaber, Tervada, etc., within the Cambay State, and in the south-west of Matar Taluka (Kaira district), saltish soil is available. However, the marshy lands known as 'khār' and 'khanjan' in the extreme south of the Pardi Taluka (Surat district), and, those available all along the coast of Gujarat, resemble in character more the soil of the Konkan, rather than the soil of Gujarat. Added to these varieties, mention may be made of the patches of 'bhejvali' (very damp) land on the banks of the river Shedoi (in the Reva Kantha Agency), which yields cold weather crops of wheat and pulse.

The above are the chief varieties of soils available in Gujarat. All the above varieties are found mixed with each other all throughout the province and they are at times found to have been adversely affected by the mixing of the sand particles nearer the hilly or stony regions. Sandy soil, 'Khokhar' soil, 'Kankriwali', 'dādriwali', 'retāl', are the names given to such varieties and they are available all over Gujarat. Such admixture of sand affects in greater or less proportion the fertility of the soil. Viewed from the point of fertility, the most fertile areas of Gujarat are Kaira (especially Charotar) and Surat districts.

LAND AVAILABLE FOR CULTIVATION

Of the 21.6 million acres of land of Gujarat, it should be pointed out that only about 14 million acres area is available for cultivation; about 2 million acres are the cultivable waste; and, about 1 million acres remain fallow every year. In this connection Table No. 1 in the Appendix gives the figures for the various States of Gujarat.

The table gives the information about 57 per cent area of Gujarat, and includes the most advanced territories of British Gujarat and the Baroda State.

From the total area of 12,492,800 acres covered by these States.

	Cultivated land is	7,681,614 acres
and,	Cultivable land lying idle is ...	1,166,325 acres

If, therefore, remaining 43 per cent area of Gujarat is considered (which is comparatively not so fertile) the figures would be as follows :—

	Cultivated land for the whole of Gujarat	14 million acres
and,	Cultivable land lying idle ...	2 million acres

The Administration Reports* of the Gujarat States give combined figures of the cultivable waste and the cultivable land lying idle, and, even if this 2 million acres land is cultivable waste, it represents 10 per cent land of Gujarat. It must, therefore, be utilised either for (1) agricultural or (2) plantation purposes.

Of the 14 million acres land cultivated in Gujarat, it is to be remembered that major portion is yielding only one crop in a year. This is so because adequate irrigation facilities are not available to this province. The topography of Gujarat renders it difficult to devise ways and means to store the monsoon waters by constructing irrigation tanks, canals, etc. It is so, because land is gradually sloping from the eastern frontier towards the western coast of the Arabian Sea.

Table No. 2 in the Appendix gives the figures of the Irrigated Land for the various States of Gujarat.

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* Difficulties of adequate statistics cannot be overlooked. In this connection it would be desirable if the Government of India make it obligatory on all the States to maintain uniform statistics and make them available for publication in the volumes of the Agricultural Statistics of India. Even though Rajpipla State Administration Reports are available to us, we cannot utilise the data given in their Reports because Rajpipla like Lunawada only keeps record of cultivated land without giving the corresponding figures for the cultivable land lying idle. While the Cambay State Administration Reports give the figures of cultivable waste (that is of cultivable land lying idle) but they do not give the figures of the cultivated land.

In this table within the area covering 52 per cent lands of Gujarat 7,310,312 acres were cultivated in 1936–37 (refer Table No. 1) out of which only 242,893 acres were irrigated mainly from wells (refer Table No. 2). The irrigated land in this area is only 3 per cent of the total cultivated land.

The Table includes the figures of the British Districts and the Baroda State which are highly advanced and developed areas in Gujarat, and which combined together occupy 52 per cent of its area. The remaining States are backward. It is, therefore, a foregone conclusion that out of 14 million acres land cultivated in Gujarat, hardly half a million acres is irrigated*. One feels shocked to find that only 3 per cent of cultivated land of Gujarat is irrigated. However, the fact remains, and, without trying to harp upon this distressing situation any more, we shall now try to study the principal crops of Gujarat.

PRINCIPAL CROPS OF GUJARAT

The main food crops of Gujarat are Millet, Juwar, Rice (known as 'Sal', 'Dangar' or paddy and the inferior quality raised is Banti–Bavto–Kodra), wheat and maize; chief pulses grown are 'gram', 'ooreed', 'mug', 'math'; and her principal oilseeds are ground nuts, sessamum, castor seeds. For our purposes we can group oilseeds, cotton and tobacco into the commercial crops. Fodder, vegetables and fruits are also grown in various parts and sometimes the surplus vegetables and fruits find outlet in the adjoining markets of Gujarat.

It should, however, be remembered that the above is not the all inclusive statement, various minor food crops are grown in Gujarat, but they are mainly meant for local consumption. Such crops are ginger, chillies, lemons, etc., Our estimate is that about 14 million acres land is cultivated in Gujarat.

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* Irrigated in the sense that they receive water mainly from wells. Hence, only in this half a million acres land second crop (winter crop) is possible. In the remaining 13½ million acres only one crop is obtained by monsoon water.

Table No. 3 in the Appendix gives under different heads the acreage under the cultivation of the Main Crops, and, Table No. 4, gives the acreage under the cultivation of Minor Crops, in the various States of Gujarat.

These tables depict the conditions as prevailing in 63 per cent area of Gujarat and shows that in this area about

	7 million acres are under the cultivation of Main Crops (for details *vide* Table No. 3).
	¼ million acres are under the cultivation of Minor Crops (for details *vide* Table No. 4).
The Note attached with the Table No. 4 in the Appendix shows that	1 million acres are under cultivation of Fodder Crops (for details *vide* the Note).
The Note attached with the Table No. 4 in the Appendix shows that in Gujarat	¼ million acres are under the cultivation of Maize Crops (for details *vide* the Note).
	½ million acres are under the cultivation of Miscellaneous Crops (for details *vide* the Note).
	Total 9 million acres.

If within the 63 per cent area or Gujarat 9 million acres are cultivated under the different crops as mentioned above, the Administration Reports of the remaining States give us enough clue as to what important crops are grown in their territories.

On the basis of this information the total acreage of land under cultivation of different crops in Gujarat is as follows :—

	Data obtained (Acres)*	Estimate of the remaining areas (Acres)	Total (Acres)
Under Food Crops (pulses included)	3,70,00,000	1,50,00,000	6,00,00,000
Rice	50,00.000	30,00,000	
Under Fodder	1,00,00,000	1,25,00,000	2,25,00,000
Under Minor Crops (specified in Table No. 4 in the Appendix)	25,00,000	25,00,000	50,00,000
Under Cotton	2,30,00,000	70,00,000	3,00,00,000
Under Oilseeds	50,00,000	50.00,000	1,00,00,000
Under Maize	1,30,000	1,30,000	2,60,000
Under Tobacco	1,30,000	1,30,000	2,60,000
Total...	8,27,60,000	4,52,60,000	12,80,20,000

With a conservative estimate, we have been able to judge the conditions of the 13 million acres under cultivation of different crops in Gujarat, and if half a million more is under cultivation that area will add to a certain extent to the cultivation acreage of the above crops, but will not materially change the above figures.

Table No. 5 in the Appendix, gives separately the figures in acres of the various oilseeds sown in the different parts of Gujarat.

Added, therefore to cotton, oilseeds, maize and tobacco are the principal commercial crops exported from the province. Ways and means should be devised to utilise these resources (commercial crops) for industrial purposes in the province. We shall try to point out a little later upto what extent there is a scope in this direction. Sufficient it is here for us, to note, that these resources are capable of further development, and after having the idea about the agricultural resources of Gujarat, we shall now try to form an estimate of the other source of wealth intimately connected with agriculture in the shape of Live Stock.

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* Refer Table No. 3, 4, and, a Note on the remaining crops cultivated in the various States of Gujarat, in the Appendix.

LIVE-STOCK RESOURCES

As regards the live stock resources of Gujarat statistics collected from more than ¾ area of Gujarat give us the following picture.

	Cattle Census* of Gujarat's ¾ area	Our Estimate of the Total Cattle Wealth of Gujarat
Bulls and bullocks ...	1,236,904	1,500,000
Cows ...	741,617	1,000,000
Calves (young stock) ...	539,591	670,000
Male buffaloes ...	32,744	40,000
Cow buffaloes ...	874,816	1,090,000
Buffaloe calves (young stock)	585,045	725,000
Sheep and Goats ...	1,009,350	1,250,000
Horses and Ponies ...	39,154	50,000
Donkeys	61,555	75,000
Camels	12,373	15,000
Mules	299	375
	5,133,448	
+Lunawada's total cattle wealth in the year 1937-38	97,539	
	5,230,987	6,415,375

(For details *vide* Table No. 6 in the Appendix.)

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* The above is the cattle census of the following areas of Gujarat:—

British Gujarat	10,193	square	miles
Baroda's Gujarat Area	6,812	do	do
Other Gujarat States :—Palanpur, Radhanpur, Cambay, Mansa, Ilol, Idar, Balasinor, Lunawada, Vijayanagar, Sant, Rajpipla, Bansda, Jambughoda, Dharampur and Sachin	8,690	do	do
	25,695	do	do

Gujarat's total area being 33,798 square miles, the above table represents the conditions of 76.5 per cent area of Gujarat.

If we analyse the above table a little further, it definitely shows us that Gujarat's main cattle wealth consists of :—Bulls and bullocks, cows, cow buffaloes, their young stock, and, sheep and goats. It is also very striking for us to find that the number of male buffaloes as compared to cow buffaloes is very low.

For the ¾ of Gujarat's area, for which we have already obtained the cattle census figures, the proportion stands as:

Cow buffaloes Male buffaloes
874,816 : 32,744

Whether from the point of view of buffaloe-breeding can this horrible disproportion in the ratio be tolerated? This is a problem deserving serious attention of the authorities concerned. However, it should be realised here that the problem of buffalo-breeding is more complicated, than what it would in ordinary course appear to be.

In this connection, it is desirable to quote the extract from the report of the Committee appointed by the Government of Bombay in 1916 to consider measures for the improvement of milk supply in large cities in the Presidency. The Committee stated that the town 'gowali' wanted the buffaloes' milk and he did not want the buffalo calf which he was unable to rear it profitably. As a result he allowed the calf to die of neglect or sometimes hastened the matters by throwing it alive into a dustbin. This meant the loss to the country every year of large numbers of calves of the best milk buffaloes.

That this picture still holds good, and, the situation has not improved will be easily realised when we find today in Gujarat as against 874,816 cow buffaloes only 32,744 male buffaloes. This means per 100 cow buffaloes in Gujarat, there are only 3.66 male buffaloes.

The young male buffalo occupies the same position in Gujarat as the young bull in Europe. In Gujarat the male buffalo is killed mostly by neglect and hence ill feeding and starvation, whereas in Europe, butcher's knife, accomplishes the very purpose in the case of the young bulls. In the Western Countries, they rear cows and slaughter all bull calves, except a few which are reared as stud bulls. In connection with our country, the case of bull, stands on favourable grounds. The male off-spring of the cow has yet proved to be even more useful than the cow herself to the Indian agriculturist. But it should be remembered that the bull will not fare a better treatment in India, the moment machinery plays a larger part in her agriculture and transports.

The male buffaloes have been ill-treated and got rid off at the earliest opportunity in India because of their sluggishness, and, inability to endure heat. These are the formidable handicaps coming in their way and they are not at all useful for cultivation except in very moist regions.

The scientists have, therefore, often stated that the buffalo should not have been domesticated at all. For, we cannot find work for the male buffalo. But, to-day we can ill-afford to follow their advice; and buffalo exists, and, increases in India, owing to the poor milking quality of the cows.

As for the adequacy of our cattle wealth, we would like to point to the Indian Social Reformer of 12th June, 1926 (p. 640), wherein we find the following statistics as regards the number of cattle per 100 of population in various countries.

In India ...	59	In New Zealand ...	150
In Denmark ...	74	In Australia ...	259
In United States	79	In the Argentine Republic ...	323
In Canada ...	80		
In Cape Colony	120	In Uruguay ...	500

Compared to the above figures in Gujarat we get the number of cattle per 100 of population to be 84. In comparison we find the figures of Gujarat not so encouraging. They reveal that we are not so well equipped with the wealth which is closely connected with our physical constitution and health.

It is so, because, the above number of 84 cattle per 100 population in Gujarat is misleading and exaggerating. For, in most of the countries the cattle are divided into two classes: milk cattle and beef cattle. In the case of the dairy breeds almost all the females which have a good conformation and good constitution are kept, but those which are faulty are ruthlessly destroyed. In the case of the males, only the bull calves from the best cows are kept alive for breeding purposes; the rest are used for human food as beef.

But India, and, (as her integral part) Gujarat, have to narrate an altogether a different tale. If analysed further, the above cattle census figures of Gujarat reveal, that about 10 to 15 per cent of the total are old cows and bullocks too old to work or breed, barren heifers, and deformed and useless animals. Often such cattle are turned out by their owners to become the prey of wild animals. They are not properly fed, and, they generally die of semi-starvation after lingering misery. In any other country, except India, these animals would not be allowed to live. They consume food needed by the working animals.

Under these circumstances, we should either be able (1) to meet our milk demands, without buffaloes, or else, (2) to find out ways and means of utilising the energy of the male buffaloes. Thus the problem of cattle breeding is a very complicated problem in case of Gujarat.

As sheep and goats are important next to bulls and bullocks in Gujarat's cattle wealth, their breeding requires immediate attention of the Gujarat States. For this will result in the yield of better quality wool and skins.

As for the donkeys, they mostly serve the needs of the potters as 'clay-carriers'. They are also engaged by the special classes like washermen, 'golas' and the wandering itinerant handicrafts men ('Ghantias', etc.). Sometimes 'dyers' also utilise their services, and, in addition for the carriage of sand, lime, etc., for building or bridge constructions, etc., they have still retained their importance. In the villages far remote from modern means of communication, the village retail traders often bring goods on donkey's backs from the adjoining market centres or towns. It is, however, gratifying to note that the donkeys have been still holding their importance as the beasts of burden in the rural economy of Gujarat.

Horses are employed in Gujarat for driving coaches. Gujarat States also employ them in their cavalry; while a small number is also owned by the villagers and others for riding purposes or to serve as the faster means of communication in times of emergency.

Camels are not many in this region, hence, we can easily overlook their small number. They are found serving as the means of communications in the backward tracts of Panch Mahals, Palanpur and Baroda. But, mention must be made of the fact, that 'Chhikārās' (wild pigs) and the 'Rojs' (wild cows) work havoc especially in the Kaira, Broach, Panch Mahals and Surat Districts. They are also a nuisance to the various States in the middle Gujarat, for they destroy the standing crops by running over the fields. Some measures should, therefore, be adopted to utilise these animals for better purposes, or, to get rid off them, as their number is likely to run in lakhs if their census is taken.

CHAPTER V

TRANSPORTS

UTILITY of the transports to the trade and commerce of a country cannot be under-rated. They play important role in shaping the economic background of a region as ultimately, they are the determining factors of the extent of its economic and industrial growth. They open up internal markets and create new demands for the natural products and the manufactured goods. They are, therefore, rightly called the sinews through which productions flow to the consumers. Swifter the transports and greater their capacity to carry the goods, speedier will be the economic and social uplift of the masses of the region, for, transports play very important role in bringing about social contact, and hence, in widening the outlook of the people and in imparting in them the idea about the standard of living. They, therefore, play key role in a country's national life. If the Government of a country encourage the exports of raw materials and imports of manufactured goods greater will be the dependence of the country on foreign productions. The country will at once become a colony producing raw materials for the highly industrialised nation. In shaping the economic policy of a region the role of transports is never overlooked.

Before the middle of the 19th century cart transport played an important role in the economic life of Gujarat. Throughout the interior of Gujarat goods used to be carried in carts; and the province was linked with the outside regions by roads mainly used by peddlars, pack bullocks, 'vanzars' and carts. Neither automobiles, nor railways were available to the province in these days*.

Inter provincial trade was mostly confined to articles

***1. For further information *vide* the Gazetteer of the Bombay Presidency, 1884 volumes.**

of food and clothing and to a certain extent to articles of luxury worked on cottage crafts. Mostly the agriculturists were visible plying their carts on the roads, and, taking their crops to the adjoining town markets. In their return journey they usually brought all the goods ordered by the village merchant from his brother merchant in the town to cater for the villagers' needs. After the monsoon was over the cart transport was thus the important occupation and mainstay of the 'Rayat' (peasant).

Even today the importance of cart-transport cannot be under-estimated. Table No. 1 in the Appendix gives the figures of the riding and load carrying carts in British Gujarat, Baroda and some of the Gujarat States. It gives us a fairly good idea about the conditions prevailing in Gujarat, as the figures given cover more than 61 per cent area of Gujarat. We shall, therefore, be not far from truth if we assert that there are, in Gujarat 4 lakhs riding and load carrying carts, from which about 1½ lakhs are the riding carts, while 2½ lakhs are the load carrying ones. We, therefore, find the interior of Gujarat mostly having the roads useful for the carts to ply.

Table No. 2 in the Appendix gives the figures of the Road Mileage of British Gujarat, Baroda and some of the Gujarat States. This table gives us the idea about the actual conditions prevailing in 74 per cent area of Gujarat, and shows that out of 6232½ miles' roads, only 2539 are motorable in fair weather (while from the motorable roads only 26 miles are the asphalt roads and 29½ miles are Macadam surfaced roads).

From the above table we can form a conservative estimate that Gujarat has at the most 10,000 miles roads of which hardly 3,000 miles are motorable in fair weather.

For the region covering something like 34,000 square miles area, this is a very sad state of affairs. It means that the interior of Gujarat needs more roads; and true to this picture the Bombay Economic and Industrial Survey Committee have pointed out that there are still many villages in Gujarat which have neither good roads nor easy access to any railway station.

The Committee found in their inquiry that about 40 to 75 per cent of the total area of the Districts of the Bombay Province were not served by roads, while large parts of the Districts were totally cut off from communication with the urban areas during the monsoon months. Percentage of villages cut off totally from outside communications during the monsoon was 83.3 per cent in the case of Surat District.

If this is the condition prevailing in the British Gujarat, the foremost part of Gujarat as regards its economic and industrial development, the conditions prevailing in the various Gujarat States can just be imagined. It is because of this lack in means of communications that the Panch Mahals, inspite of vast forest and mineral resources, still remain a backward area.

If the pace of industrialisation is to be perceptibly quickened, adequate measures should be adopted to increase and improve the transport facilities in the interior parts of Gujarat.

Even from the point of view of securing better return for the cultivators' produce increased transport facilities are absolutely necessary.

The effects of the transport difficulties are chiefly noticeable in connection with the trade of milk and vegetables. The growing of vegetables in Gujarat is confined to villages mostly within a narrow radius of eight to ten miles from the city. It would not pay to the cultivators to grow vegetables because there is no market for them if they were more than 20 miles away from a big city. A concrete example in this case can be given of the Chorasi Taluka of the Surat District. This is the only Taluka of the District, in which vegetables and garden produce are grown extensively and, most of the villagers of this Taluka are within the radius of 10 miles from Surat.

In many villages of the Bardoli Taluka cultivators make ghee out of milk, for, there is no local market for milk. Same is the condition in the various Gujarat States, and their economic growth is hampered a great deal by inadequate transport facilities. Most of the interior States have neglected railway construction as yet, and they are not having motorable roads at all.

RAILWAYS

As already pointed out, the construction of railways begun in Gujarat from about the later half of the 19th century*. The railways are, therefore, of comparatively recent origin in Gujarat. First the B. B. & C. I. Railways, were constructed by the British Government and later on the Baroda State took the initiative. Other States are, however, marking time in this connection and only a few of them have a small mileage to their credit. As a result of the efforts made by various parties, today Gujarat's total mileage of railways is 1720. According to the different gauges their mileage is as follows :—

Broad Gauge	...	5ft. 6 inches	604 miles
Metre Gauge	...	3ft. 3⅜ do	555 do
Narrow Gauge	...	2ft. 6 do	561 do
			1720

(Table No. III in the Appendix gives in details the Railway mileage in Gujarat.)

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*For the history of the Railways Construction in Gujarat, *vide* the Gazetteer of the Bombay Presidency, and, Baroda volumes and also the Administration Reports of the Gujarat States.

Most of these Railways are controlled by the various States and some by the public agencies. Viewed from this angle their mileage stands as under :—

				Miles
Belonging	to the	Government of India	...	764.12
do	do	Baroda State	...	705.44
do	do	Remaining States	...	78.23
do	do	Public Companies	...	173.08
				1720.87

As compared to the rest of India, or, other important parts of India Gujarat seems to have comparatively more railway mileage to her credit. This is brought out clearly by the following table giving the railway mileage per 100 square miles of territory.

		Mileage (per 100 sq. miles)
India ...	...	21
Bombay Presidency	...	26
Kathiawar ...	...	43
Gujarat ...	...	58

But it should be realised that more than 90 per cent of Gujarat's railway mileage happens to be within the British Gujarat and Baroda State territories.

Out of 1720 miles railways, British Gujarat and Baroda State claim to have 1469 miles railway construction within their territories, while for the rest of the Gujarat, that means for the remaining 50 percent area of Gujarat, the railway mileage is hardly 200.*

Under the circumstances the need for the railway construction in the Gujarat States is easily brought home to us. Some of the States have made attempts to survey such possibilities. While others like Balasinor, Santrampur, Jambughoda have their own difficulties in undertaking such schemes. Most important difficulty is that of finance, which can be easily mitigated by attracting outside capital. This can be done by democrating the States' administration.

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*Added to 78.23 miles railways owned by the rest of the Gujarat States, 25.28 miles Godhra-Lunawada and 88.73 miles Ahmedabad-Prantij railways owned by the public companies may also be said to be serving the needs of the rest of the Gujarat States.

Not only the railways are owned by something like 8 different agencies in Gujarat, but within the territories of the same State we find railway lines of different gauges. This sort of construction increases the overhead expenditure, terminal charges, etc. In the better interests of the province a unified management is more welcome. This will solve the hardships resulting from the variation, in rates, and especially in terminal charges, resulting from the management of different authorities.

Moreover, while British Gujarat and Baroda areas are having greater portion of road and railway mileage to their credit, because of the neglect of the States road-rail competition has ensued within these territories. This sort of competition is keenly felt in British Gujarat. Even when about 40 to 75 per cent of the total area of the British Districts of Gujarat are lacking in road transport, in the remaining areas road and rail competition goes on unabated. Out of 619 miles roads motorable in fair weather in British Gujarat, about 370 miles roads run parallel to railway lines.

Table No. 4 gives us the idea as to how within the British Gujarat for 262 miles buses directly compete, and, in addition for 108 miles indirectly compete with the railways. This state of affairs cannot be tolerated, when we realise that there is the dearth of roads in the interior of Gujarat. Sooner the sane policy evolved the better for this region.

In the end, we refer to the 200 miles coast line of Gujarat most of which falls within the British Gujarat. If proper attention is paid to the development of the ports like Surat, Broach, Cambay, etc., naturally the neglected road-steads like Sarod, Kavi, Tankara, Jambusar, Sajod, Hansot, Bhagwa, Maroli, Navsari, Matwad, Dandi, etc., will begin to hum with business life. This can be a practical proposition only if the Government of India reserve the coastal trade for the country crafts or for the indigenous shipping companies and avoid the competition in rates between railways and shipping companies. Water transport is always cheaper than road transport*, hence, all the advantages should be taken of the natural creeks which afford good road-steads to Gujarat. Interior of the Gujarat should be connected with coast line by a good net work of railways, but the water and land carriers should not run on parallel lines with a view to enter into unhealthy competition with each other. A judicious State policy is needed in this connection.

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*For the development of ports of Gujarat, and, for increasing their utility, we have made ample suggestions in the Chapter I on Geographical Background. We, therefore, do not find any necessity of repeating the same here.

CHAPTER VI

HUMAN ELEMENT

A COUNTRY'S natural wealth depends for its development upon the human element it has at its disposal. Its geographical wealth (in the shape of agricultural, mineral, marine or forest resources) requires to be handled by some motive power which is ultimately regulated by Man. Thus Man and his organising capacity are the vital determining factors for a country's economic and industrial progress. However, a man's capacity, in itself, is influenced by the geographical surroundings. He himself is the part and parcel of Nature and tries at the most his level best to adopt himself to the natural surroundings. If, therefore, the people of a country are predominantly occupied in agricultural pursuits, the characteristics such as mobility and adaptability, in short, the organising capacity on the industrial lines will be conspicuous in them by its absence. They are likely to be more conservative, less organised, less literate than their fellow-beings, in the industrial areas. It is, therefore, necessary to study Man in Gujarat, in relation to the natural environments with which this province is endowed by Nature. This will enable us to judge whether he is upto the mark to handle the resources efficiently and to develop them to the full extent. His deficiencies in all these directions will give us sufficient clues to devise the ways and means to improve the existing conditions. Hence realising full well that Labour is one of the prime factors of production, we, shall study this problem from three different angles: *viz.*

I. Constitution of Labour :—

(*a*) Urban and Rural.
(*b*) Literate and Illiterate.
(*c*) Mobile and Immobile.

II. Present Occupational Returns.
III. *Need for diversion of Occupations.*

BASIS OF CALCULATION

Gujarat, like Kathiawar, is composed of heterogeneous units under different governments. We may classify and group together its various political units as under :—

(1) Gujarat States comprised in the Western India States Agency.
(2) Baroda State Territory in Gujarat.
(3) British Districts in Gujarat.
(4) Bombay States and Agencies in Gujarat.

As regards British Districts in Gujarat we are handicapped to some extent in our calculations regarding the Ahmedabad District. The Talukas of Dhandhuka and Gogha Peta of this District are situated in Kathiawar; for these separate statistical information is not available. We have, therefore, taken into account the population of Ahmedabad District as a whole, in our study. However, this will lead to a mistake of commission to the extent of only 4 p.c. when the total area of Gujarat is taken into consideration. But this is a very minor fraction and as such it can be easily overlooked. More so, because similar characteristics just as in Gujarat, prevail in these tracts of Kathiawar and added to this, in arriving at various percentages, the population of this area is also averaged. It being so, our conclusions are not going to be materially affected at all by this slight mistake of commission on our part.

AREA AND POPULATION

According to our calculations the total area of Gujarat is 33798 square miles (for details *vide* Table No. 1 in the Appendix). It is divided into four major units :—

(1) Gujarat States included in Western India States Agency with an area of 6394 sq. miles.

(2) Baroda State Territory in Gujarat with an area of 6812 Sq. miles.

(3) British Districts in Gujarat with an area of 10193 Sq. miles.

(4) Bombay States and Agencies in Gujarat with an area of 10399 Sq. miles.

Population figures of last six censuses for Gujarat, together with the proportionate increase or decrease from the previous decade's figures, are given in the following statement :—

Year	Population	Increase or Decrease in population during the ten years period	
1881	69,00,016		Increase in population between 1881 and 1931 is 11.7 p.c.
1891	76,95,715	11.5 p. c.	
1901	61,05,895	20.6 p. c.	
1911	65,12,622	6.6 p. c.	
1921	68,73,718	5.5 p. c.	
1931	77,11,450	12.1 p. c.	

(For details *vide* Table No. 2 in the Appendix.)

These figures taken as a whole compare unfavourably with those of Kathiawar for the corresponding years. While the total population of Kathiawar between 1881 and 1931 increased by 31.8 p.c. the population of Gujarat increased only by 11.7 p.c. This can be accounted for by the rise of especially Kathiawar ports and hence the exodus of people from the adjoining territories of Gujarat like Bannas Kantha Agency etc. to Kathiawar ports.*

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*For further enlightenment *vide* Chapter on Human Element from *Kathiawar Economics* by the same author.

DENSITY

The density of population in Gujarat in 1931 was 228 persons per square mile. For details *vide* Table No. 1 in the Appendix. This compares favourably with

Kathiawar	...	142
Bombay Presidency (including Sind)	...	173

But this figure is low and compares unfavourably with even several of its units like

Baroda	...	299
Ahmedabad District	...	240
Kaira	...	458
Surat	...	420

Moreover, if further analysed the density of population of Gujarat in the area grouped under Western India States Agency (*viz.* in Banas Kantha Agency including Palanpur and Radhanpur States) is 84 persons per square mile; while in the area grouped under Bombay States and Agencies it is 165 persons per square mile. On the other hand, the density of population is higher in the British Districts of Gujarat, where it works out at 316 persons per square mile, and, in the Baroda State territory of Gujarat where it works out at 329 persons per square mile. This shows that in Gujarat except Baroda State and the British Districts rest of the area is very thinly populated.

POPULATION BY TOWNS AND VILLAGES

To ascertain whether Gujarat is predominantly an agricultural or an industrial province it is necessary to analyse the census figures further and to study the distribution of population into rural and urban areas.

The statement below shows that there are 103 towns and 12,791 villages in Gujarat.

Unit	No. of Towns	No. of Villages
Gujarat's area under Western India States Agency ...	3	1,270
Baroda State Territory in Gujarat ...	44	2,636
British Districts in Gujarat ...	37	3,270
Bombay States and Agencies in Gujarat ...	19	5,615
Total ...	103	12,791

(Table No. 1 in the Appendix gives in detail the number of towns and villages for every important State in Gujarat.)

Between 1921 and 1931 Gujarat's total population increased by 12.1 p. c. But it will not be out of place here to recall that if this period proved that rural population was losing ground relatively to the urban in Western India States Agency,* the same tendency must have been prevailing in Gujarat as both the territories have close connections and represent similar characteristics. However, even if that tendency is visualised, Gujarat is still a predominantly rural area, as will be seen from the following statement.

Total Population of Gujarat	Urban	Rural
77,11,450	14,63,988	62,47,462
Percentage 100	19	81

(For details *vide* Tables No. 3 and 4 in the Appendix.)

******Vide* **Chapter IV on "Human Element" by the same author from** ***Kathiawar Economics.***

Only one-fifth of the total population of Gujarat resides in urban areas. Even though these figures compare unfavourably with Kathiawar, they compare favourably with other parts of India, as will be seen from the following statement.

Unit	Percentage of Urban and Rural Population to Total Population	
	Urban	Rural
Kathiawar ...	25.5	74.5
Bombay Presidency (including Sind) ...	20.9	79.1
Assam ...	3.4	96.6
Madras ...	13.6	86.4
United Provinces ...	11.2	88.8
North-West Frontier ...	8.2	91.8
Central Provinces and Berar ...	9.8	90.2
Bihar and Orissa ...	4.0	96.0
Gwalior ...	11.2	88.8
Mysore ...	15.9	84.1
Punjab ...	12.4	87.6
Bengal ...	7.3	92.7

The high degree of urbanisation in Gujarat is due to the fact that out of 103 towns, 92 contain a population of over 5000 persons. This is because of the existence of a number of independent jurisdictions in Gujarat. Each of them have their independent capitals which for reasons historical and local have attracted people to reside therein. Detailed figures in respect of the urban and rural population in the prominent States are given in Table No. 3 in the Appendix.

THE POPULATION OF VILLAGES

Predominance of agriculture in the economic life of Gujarat is proved by the fact that out of every 1000 persons

810 live in the villages. If the rural population is further classified only 179 per mille of the population living in the villages, live in the villages with a population over 2000; 523, in the villages with a population between 500-2000; and 298, in the villages with a population under 500. Table No. 5 in the Appendix gives details of each State as regards the number of towns, villages and population distributed into such classified groups.

The following statement gives us the idea of the number of villages in the different groups:—

No. of Villages	Class Units	Population
8,793	I under 500	18,53,806
2,462	II 500—1000	17,18,777
1,146	III 1000—2000	15,58,605
401	IV 2000—5000	11,19,256

(For details *vide* Table No. 5 in the Appendix.)

This classification clearly demonstrates that nearly 69 p. c. of the total number of villages of Gujarat have a population under 500. Nearly 46 p. c. of the total population of Gujarat lives in the villages with population below 1000. Moreover, if we exclude the cities of Ahmedabad and Baroda which between them have a population of 4,10,639, equivalent to 29 percent of the total urban population, the ratio of urban population to the total population at once falls to 14 per cent.

Statement giving comparative idea of the distribution of Village Population in different units in Gujarat and Kathiawar

Unit	GUJARAT				KATHIAWAR			
	No. of Villages	P. C. to the total No. of Villages	Population	P. C. to total population	No. of Villages	P.C. to total No. of Villages	Population	P. C. to total population
Class I Under 500	8,793	68.8	18,53,806	24.0	2,959	65	7,63,150	24.2
Class II 500–1000	2,462	19.5	17,18,777	22.2	1,135	24.8	7,81,858	24.8
Class III 1000–2000	1,146	8.6	15,58,605	20.2	373	8.0	5,07,348	16.1
Class IV 2000–5000	401	3.1	11,19,256	14.5	101	2.2	2,98,142	9.4

(For details *vide* Table No. 5 in the Appendix.)

This statement clearly sets forth the uneven distribution of villages in the various units in the case of Gujarat. Population residing in the villages under 1000 is almost one-half of the total population of Gujarat. Gujarat hardly fares better than Kathiawar in this respect in the first three units. However, as regards the last unit of population between 2000—5000, 14.5 per cent of the total population resides in this group in the case of Gujarat, while correspondingly only 9.4 per cent resides in this group in the case of Kathiawar.

If the above figures for the Gujarat as a whole are compared with one of its comparatively progressive States, viz. the Baroda State, the situation seems to be more unfavourable as will be seen from the following Statement.

BARODA STATE

Unit	No. of Villages	P.C. to the total No. of Villages	Population	P.C. to total Population
Class I under 500	1,580	54.1	4,00,578	16.7
Class II 500–1000	777	26.6	5,47,123	22.3
Class III 1000-2000	419	14.4	5,69,393	23.3
Class IV 2000-5000	144	4.9	4,02,910	16.4

This statement illucidates our point to a marked degree. That in Baroda territory there is a marked tendency among the population to reside in big villages; and that in that State better symptoms towards urbanisation prevail. For further verification we lay down the following statement to bring home our analysis about the uneven distribution of population in the various groups in Gujarat and Kathiawar as compared to Baroda.

Population	Gujarat	Kathiawar	Baroda
Total Class I and II ...	46.2 p.c. of the total population	49 p.c. of the total population	39 p.c. of the total population
Total Class III and IV	34.7 p.c. of the total population	25 p.c. of the total population	39.7 p.c. of the total population

It is not so much the greater percentage of rural area, but the uneven character of the various units that compose it, which we shall have to carefully bear in mind while considering the need for industrialisation.

AGE

In order to ascertain the number of the able-bodied persons available for employment either in trade, transport, industry, agriculture, etc., it is essential to make the classification of the population into various age groups. This will reveal the progressive or regressive character of the population.

Swedish Statistician Sundburg is of the opinion that in Western Countries the number of persons aged from 15 to 50 years is generally about half the population. Variations which occur in the age composition, take place in the other two age groups viz. 0—15, and 50 and over. The Sundburg formula is later on elaborated by Whipple by classifying them into five fundamental types viz: Progressive, Stationary, Regressive, Secessive and Accessive. Thus the Sundburg formula is restated by Whipple in the following form:—

Age Period	Progressive	Stationary	Regressive	Secessive	Accessive
0—15	40	33	20	40	25
15—50	50	50	50	40	60
50 and over	10	17	30	20	15

Our analysis of Gujarat's population on the above lines yields us the following results:—

Age Group	Gujarat year 1931	Kathiawar year 1931	All India year 1921
0—15	40.44	42.07	39.00
15—50	50.09	47.35	50.00
50 and over	9.47	10.58	11.00

Judged from this angle, the population of Gujarat can be said to be progressive. The statement below gives the comparative idea of the age composition of Gujarat and Kathiawar's population in 1931 and the age composition of England and Wales' population in 1921.

Age Period	Gujarat 1931		Kathiawar 1931		England and Wales 1921	
	Males	Females	Males	Females	Males	Females
All ages	519	481	509	491	477	523
0—5	74	75	78	80	44	43
5—10	71	63	72	67	47	46
10—20	115	103	117	107	94	95
20—40	158	147	144	143	142	168
40—60	83	75	77	72	109	119
60 and over	18	18	21	22	41	52

Statistics have already proved that unlike Western Countries infant mortality is greater in India. The above statement demonstrates that the same holds true in the case of Gujarat and Kathiawar. The number of persons in the lowest age groups is definitely greater in Gujarat and Kathiawar (and same is the case if all India figures are taken into consideration) while the number of persons in the highest age groups is definitely smaller when compared to the figures of the Western Countries. This is due to the much greater infantile and child mortality in Gujarat and the shorter average life.

Table No. 6 in the Appendix shows the distribution of the total population, Males and Females, in various age groups.

Distribution of population per mille over the age groups is shown in the following statement and its comparison is also made with the Bombay Presidency, Baroda and Kathiawar figures for 1931.

Age Groups	Gujarat	Bombay Presidency (including Sind)	Kathiawar	Baroda
0—5	149	150	158	149
5—10	133	131	139	125
10—15	122	115	127	118
15—20	95	89	95	99
20—30	171	183	164	170
30—40	135	146	125	132
40—50	100	94	92	102
50—60	58	55	57	63
60 and over	37	37	43	42

The figures reveal that in the age groups from 20—40 the ratios are unfavourable to Gujarat. The same is the case with Kathiawar. To what extent emigration should be considered to have caused this lower ratio it is very difficult to estimate. But it is probable that to a certain extent this lower ratio is due to emigration. As vital statistics for Gujarat do not exist, it is impossible to ascertain the extent to which mortality rates account for the fall in Gujarat in the number of persons in the prime of life.

SEX

Out of 77,11,450 persons in Gujarat (according to 1931 Census), 39,96,104 were males, and, 37,15,346 were females. (For details *vide* Table No. 7 in the Appendix.)

There is, therefore, an excess of 2,80,758 males. The ratio of females to males works out 930 females per 1000 males. In the Bombay Presidency the corresponding female ratio is 909. Following statement gives a comparative idea of the number of females to 1000 males for various areas in India and elsewhere.

Province		Females per 1000 males
England and Wales (1921)	...	1,087
Scotland (1921)	...	1,082
Bombay Presidency (including Sind)		909
Ajmer-Merwara	...	892
Assam	...	909
Baluchistan	...	778
Bengal	...	924
Bihar and Orissa	...	1,008
Burma	...	958
Central Provinces and Berar	...	1,000
Madras	...	1,025
North-West Frontier Province	...	843
Punjab	...	831
United Provinces	...	904
Baroda	...	942
Mysore	...	955
Kathiawar	...	966

The figures of England and Wales (1921) and Scotland (1921) cannot be taken as representative, as they depict the immediate condition after the termination of the world war. Naturally, in these regions, therefore, females will be in excess to males. However, compared to the Bombay Presidency figures, or, to some of the provinces of India, Gujarat, Kathiawar, even Baroda State and Mysore show comparatively high female ratio. Male emigration to a certain extent accounts for this particular phenomena. Table No. 8 in the Appendix gives separate figures of the female ratio per 1000 males for every prominent State of Gujarat.

The following statement gives a further division of the Male and Female population of Gujarat into rural and urban.

Population	Total	Urban	Rural
Females	37,15,346	6,92,758	30,22,588
Males	39,96,104	7,71,230	32,24,874
Total	77,11,450	14,63,988	62,47,462

(For details *vide* Table No. 3 in the Appendix.)

In the rural areas the female ratio works out at 937 per 1000 males, while in the urban areas it works out at 899 per 1000 males.

This tendency is quite in contrast with Kathiawar. As far as Kathiawar is concerned, in the rural areas the ratio of females per 1000 males is 958, while in the urban areas it is 988. This is mostly due to the immigration of female population to the urban areas for getting some job. In Kathiawar the number of cultivating owners is miserably low when campared to that in Gujarat. Hence the female folk is required to augment the family income by migrating to the towns ; while in Gujarat the cultivating owners take more interests in agriculture and can afford to employ this female labour in agriculture with advantage.

LITERACY

Out of a total population of 76,25,715 persons 9,39,491 have been returned as literate by 1931 Census. Of these, 7,96,883 are males and 1,42,608 are females. The statement below compares the literacy figures per mille of the total population of Gujarat with those of Baroda and Kathiawar.

Area	Literate	
	Number of Literate Males per 1000 of the male population	Number of Literate Females per 1000 of the female population
Gujarat	201	39
Baroda	330	79
Kathiawar	234	54

It will be noticed that Gujarat fares bad in male literacy as well as female literacy when the ratio is worked out per mille on the above basis. Even Kathiawar claims more number of literates per mille of the male and female population when such ratios are worked out. (Table No. 9 in the Appendix is the general table showing literacy by Age and Sex.)

A casual glance at it convinces us that the standard of literacy varies considerably in the various units. Moreover, it also depends upon the comparative size of the units and the extent of urbanisation therein. Problems of education differ according to local circumstances, and, as such no general policy can be evolved which can be applied consistently to all the parts of this province. The following statement gives in detail the comparative idea of literacy as prevailing in various age groups in Gujarat, Kathiawar and Baroda.

Age Group	GUJARAT			KATHIAWAR			BARODA		
	Total per mille population	For 1000 each		Total per mille population	For 1000 each		Total per mille population	For 1000 each	
		Males	Females		Males	Females		Males	Females
5-10	72	38	34	80	60	20	118	83	25
10-15	132	71	61	139	105	34	221	159	52
15-20	198	103	95	194	153	41	331	239	72
20& over	156	81	75	158	135	23	208	182	26

In all aspects Gujarat as a whole compares unfavourably with Baroda. As for literacy in English out of a total population of 76,35,715 only 74,401 persons are literate in English in Gujarat. Out of 4,918 females literate in English, if we exclude 1804 females literate in English belonging to the Baroda State territory, which itself comprises of about 1/5th of the Gujarat area, only 3,114 females are literate in English in other parts of Gujarat (British Districts included.) This is, therefore, a very discouraging figure. We find from our observations that agriculture is still the backbone of Gujarat's economy and the province as such is very backward in education. It is upon this comparatively backward and hence inefficient manpower that the industries of Gujarat, wherever they exist, depend. We, therefore, would proceed forward to study the problems of the mobility of labour in Gujarat.

MOBILITY OF LABOUR

Indian Labour is often considered to be very cheap and at the same time, very dear. It is cheap as regards the payment of wages. Taking into consideration the low wage standard of living in India, the Indian worker is prepared to work at a low wage when compared to his fellow worker in the Western countries. But because of the want of technical training the Indian worker is inefficient and hence more workers have to be employed in the factories and more wastage, breakages, etc. occur in India than in England. Moreover, the output in other countries is larger per hour than is the case with India. This is partly due to the absence of technical schools and partly to the illiteracy of the Indian worker.

As for Gujarat it will be noticed that it has within its territory only 103 towns, while it boasts of having 12791 villages. Moreover, out of these villages 8,793 have less than 500 population each. Under these circumstances various geographical factors do come in the way of the efficiency of the worker in this province. The prevalence of the caste system, and hence his conventional and conservative outlook deter a villager from leaving his village to find out wider opportunities abroad. Absence of educational institutions account for his illiteracy. Out of 76,35,715 persons only 9,39,491, have been returned as literate by the 1931 census. That too they are literate in the sense in which it is understood in the Census 'of being able to write and read a letter to and from a friend.' Of this number greater part of the educated people reside in towns. In the villages not only there is the absence of proper educational facilities, but because of the absence of road facilities, proper contact with the adjoining areas is also lacking. These handicaps go a great deal in accounting for the backwardness and conservative outlook of a village worker.

It cannot, however, be ascertained that enough hands are not available for the new industrial enterprises. From our observations we can safely lay down that mobility as such has not hindered the growth of industries in Gujarat. There are other factors coming in the way of the development of industries and we have discussed them at full length in Part II of our book. Sufficient it is for us to bear this in mind, and find out as to what is the strength of the able-bodied non-workers in Gujarat.

OCCUPATIONAL RETURNS

In the Census Volumes all occupations are divided into four classes. These four classes are further sub-divided into twelve sub-classes, 55 orders and 195 groups.

The four classes and their sub-classes are made as follows :—

Class	Description	Sub-Class	Description
A.	Production of raw materials	I	Exploitation of animals and vegetation.
		II	Exploitation of minerals.
B.	Preparation and Supply of material substances.	III	Industry.
		IV	Transport.
		V	Trade.
C.	Public Administration and Liberal Arts.	VI	Public Force.
		VII	Public Administration.
		VIII	Professions and Liberal Arts.
D.	Miscellaneous.	IX	Persons living on their own income.
		X	Domestic Service.
		XI	Insufficiently described occupation.
		XII	Unproductive.

PROPORTION OF WORKERS AND NON-WORKERS IN GUJARAT.

Out of the total population of 76,35,715, 23,74,077 persons are returned as principal earners, 11,35,935 as working dependents and the rest 41,25,703 as non-working dependents. (For particulars *vide* Table No. 10 in the Appendix.)

The ratio of workers to non-workers per 1000 of total population comes to 460 to 540. As for Kathiawar, the ratio of workers to non-workers per 1000 of total population comes to 382 to 618. In this respect Gujarat compares favourably with Kathiawar.

However, if we turn our attention to the figures of working dependents of Gujarat as a whole, we find that the ratio of 148.6 working dependents per mille of the population is made up of 47.3 males and 101.3 females. In other words, 20.8 per cent of the female population of Gujarat is helping to augment the family income by some form or other of economic activity. If females under 15 and over 50 years are excluded, 64 per cent of all females, of more or less able bodied ages are doing some kind of economic work. This is more striking when compared to Kathiawar, where the corresponding figure is 43 per cent. But this can be explained easily when we remember that out of 516 per mille of workers employed in agriculture, only 67 are cultivating owners and 209 tenant cultivators in Kathiawar; while in Gujarat out of 553 per mille of workers employed in agriculture 245 are cultivating owners and 31 tenant cultivators. Hence in Gujarat cultivating owners find it more convenient and economic to employ their female folks in agriculture to help them rather than to allow them to go elsewhere in search of work.

The following statement gives the ratio, per mille, of working dependents, to the total population, and also, the percentages of female working dependents to the total female population in Gujarat. The corresponding ratios of Bombay Presidency and Kathiawar are included in the statement for comparative study.

Item	Gujarat	Bombay Presidency (including Sind)	Kathiawar
Ratio, per mille of working dependents to the total population	148.6 Males 47.3 Females 101.3	61.3 Males 23.6 Females 37.7	120.6 Males 49.7 Females 70.9
Percentage of Female working dependents to the total female population	20.8	7.9	14.4
Percentage of females excluding those under 10 and over 60 to the total female poulation	67.9	67.2	65.6
Percentage of female working dependents to able bodied females	41.1	16.0	30.0

Both the above statements clearly demonstrate that in Gujarat as compared to Kathiawar or to Bombay Presidency a greater number of able bodied females augment the family incomes by engaging themselves in some kind of work or economic activity. The higher percentage of female working dependents to able-bodied females in Gujarat, and, also of the female working dependents to total females, we note here. Further discussion on these figures we have undertaken while analysing the census figure for Female Occupations in Gujarat.

PROPORTION OF EARNERS AND WORKING DEPENDENTS IN EACH CLASS

If the census figures are analysed further they give the following proportion of working dependents per 1000 principal earners in each occupational class.

	Class	Proportion of Working Dependents per mille of principal earners
A	Production of raw materials	620
B	Preparation and supply of material substances	163
C	Public administration and Liberal Arts	46
D	Miscellaneous	330

Thus the highest proportion of working dependents is in Class A, which represents the 'Production of raw materials.' It is this class which includes the exploitation of animals and vegetation of which agriculture is the most important component. Class B includes 'Industry, Transport, and Trade.' Here the proportion of working dependents is lower. While 730 out of every 1000 occupied persons are engaged in the exploitation of animals and vegetation, only 142 per mille of engaged persons are occupied in industry and trade. The most striking feature, which is thus borne out of these statistics is the predominance of agricultural occupation in the economic life of Gujarat. Even though it is comparatively one of the highly industrialised provinces of India, agriculture is still the principal source of occupation of its people.

PROPORTION OF WORKERS IN EACH CLASS

Class	Sub-Class	Per 1000 Workers
I	Exploitation of Animals and Vegetation	730
II	Minerals ...	1
III	Industry ...	100
IV	Transport ...	13
V	Trade ...	42
VI	Public Force ...	7
VII	Public Administration ...	10
VIII	Professions and Liberal Arts ...	16
IX	Persons living on their income ...	4
X	Domestic Service ...	9
XI	Insufficiently described occupations ...	59
XII	Unproductive ...	9

Out of every ten workers in Gujarat seven are agriculturists, two are engaged in industry and trade. All other kinds of occupations together employ one out of ten.* (For details *vide* Table No. 11 in the Appendix.)

In Gujarat out of every thousand persons 460 are "Workers". The following statement gives their distribution among various classes of occupations.

Class	Earners	Working Dependents
A. Production of Raw Materials	203	129
B. Preparation and Supply of Material Substances	61	10
C. Public Administration and Liberal Arts	14	1
D. Miscellaneous	28	9

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*In this case Gujarat compares unfavourably with Kathiawar; *vide* "*Kathiawar Economics*" Chapter V on Agriculture, by the same author.

The importance of Agriculture in the economy of Gujarat is further brought home to us by this statement. Similar figures for Bombay Presidency and Kathiawar are given below.

Class	Bombay Presidency (including Sind)		Kathiawar	
	Earners	Working Dependents	Earners	Working Dependents
A.	219	47	133	88
B.	66	6	74	18
C.	14	1	22	2
D.	31	8	32	13

If agriculture is excluded, we find that in the Bombay Presidency there are 15 working dependents to 111 principal earners, and, in Kathiawar 33 working dependents to 128 principal earners, while in Gujarat there are 20 working dependents to 103 principal earners. The predominance of agriculture in the rural economy of Gujarat can also be taken as a sign of low standard of living of the people of this region. However, various causes responsible for this lack of initiative for industrial pursuits on the part of the people, have been discussed by us at greater length in surveying the existing industries of the province, and we now propose to analyse the occupational sub-classes a little further in order to get the correct idea about the industrial occupations of the people.

DETAILS OF OCCUPATIONAL SUB-CLASSES

Sub-Class III—Industry accounts for 3,49,260 persons employed under this head. The statement below gives us some clue as to the importance of various industries in the economic life of Gujarat.

INDUSTRY

Order No.	Description	Workers of all kinds
5	Textiles	1,25,882
6	Hides, Skins, etc.	20,905
7	Wood	36,575
8	Metals	15,494
9	Ceramics	33,011
10	Chemical Products, etc.	11,797
11	Food	10,313
12	Dress and Toilet	53,506
13	Buildings, etc.	15,343
17	Miscellaneous and Undefined	26,434

(For details *vide* Table No. 12 in the Appendix.)

Textiles is the largest single item contributing to the total. About 36 per cent of the persons engaged in industries in Gujarat are occupied in textile industries. However, it should be noted here that the majority of the workers under this head are cottage workers. Textile mills have come into existence at Ahmedabad and few other places in Gujarat, but still to a greater extent this industry is on cottage basis. Further information on this point is given in Part II of this book, where survey of the existing Textile Industries of Gujarat is carried out. An examination of other items reveals that mostly the artisans, craftsmen and cottage workers are engaged under the heads of Hides and Skins, Wood, etc. Workers in 'Metals' are mostly black-smiths, copper-smiths, etc. The workers in Ceramics are mostly potters and makers of earthenwares. The makers of chemical products are mostly engaged in refining vegetable oils, while those engaged in 'Food' industries are rice-pounders, huskers, butchers, sweetmeat and condiment makers, and tobacco manufacturers (bidi-makers), while those under the head 'Dress and Toilet' are Dress-makers, Washers, Cleaners and Barbers (Darjis, Dhobis, Bhangis and Hajams). Persons engaged in 'Buildings etc.' are mostly stone-cutters, brick-layers, masons and the like. Though of late it should be realised that factory life has made its appearance to a very limited extent in most of these industries, bulk of the industries still remain unorganised and on the handicraft basis. Exact idea about the industrial structure in Gujarat is given in Part II of this book while studying the conditions of the existing industries of Gujarat, and, now we would like to proceed further to gauge the importance of trade to the economic life of this province.

'Trade' employs 1,46,128 persons in Gujarat, and if analysed further the distribution of workers is found mainly under the following sub-heads :—

SUB-CLASS V : TRADE

Order No.	Description	Workers of all kinds
23	Banks, Establishments of Credits etc.	14,818
24	Brokerage, Commission Agents, etc.	1,059
25	Trade in Textiles	12,637
26	Trade in Skins, Leather, etc.	1,321
27	Trade in Wood	1,076
31	Hotels, Cafes, Restaurants, etc.	7,635
32	Other Trade in Food Stuffs	64,418
36	Trade in Means of Transport	2,977
37	Trade in Fuel	2,701
38	Trade in Articles of Luxury	2,177
39	Trade (other sorts)	35,309

(For details *vide* Table No. 13 in the Appendix.)

As will be clear from the above statistics a greater number of persons are engaged in 'Food Stuffs' trade;

Next to this in importance is the 'Trade in Textiles,' and, 'Banks, Establishments of Credits, etc.' Food and clothing are the primary needs of mankind and hence the existence of a greater number of dealers under this head is quite natural. 'Hotels, Cafes, and Restaurants', though they have been the boarding houses for many of the workers in towns, employ only 7,635 persons, while 'Trade in articles of Luxury', which can give us some clue as to the standard of living of the people of this province, employ only 2,177 persons. The large number of banks and eastablishments of credits, etc. gives some idea about the existence of the indigenous bankers and the money lenders who advance loans to the agriculturists against the commercial crops of Gujarat like cotton, tobacco, oil-seeds, etc.

Traders in 'Food Stuffs' are mostly the dealers in grain and pulses, sweet-meats, sugar and spices, dairy products, tobacco, etc. Traders in 'other sorts' include general store-keepers and shop-keepers, otherwise unspecified, including itinerant traders, pedlars, and hawkers.

OCCUPATIONS OF WOMEN

The Census of 1931 shows that there are 37,15,346 females in Gujarat. Out of them 4,34,476 are returned as principal earners, 7,73,971 as working dependents, while 15,06,899 are returned as non-working dependents. Thus out of every 1,000 females in Gujarat, 325 are workers and 675 are non-working dependents. Females aged under 10 and over 55 (taking 1,08,460 for the age group 55-60 out of a total of 2,08,460 for the age group 50-60) are 13,00,163. If these be excluded as incapable of doing work, we find 23,70,122 females available for work in Gujarat, which means we get 646 per mille of total female population as available for work either as principal earners or working dependents. However, actually only 12,08,447 females are augmenting the family income either as principal earners or working dependents in Gujarat, and, the rest are all non-workers. Hence in studying the industrial problems of

Gujarat, some such occupations, which can induce these remaning able-bodied eleven lakhs non-workers to work have got to be recommended.

The following statement gives the comparative figures for the Bombay Presidency and Kathiawar together with those for Gujarat.

Category	Bombay Presidency (including Sind)	Kathiawar	Gujarat
Workers	216	209	325
Population aged 10 to 55	649	638	646
Non-Working Dependents	784	791	675
Population aged under 10 and over 55	351	362	354

Gujarat compares favourably with Bombay Presidency and Kathiawar. Yet, half the number of the able-bodied females consists of non-workers. Hence, some new avenues for them have got to be found out in order to improve their standard of living and to add to the general prosperity of the province. Idle manpower of Gujarat has got to be marshalled and special efforts have got to be made to develop its wealth, and the means of subsistence. 'Industrialism' is thus the crying need of the hour, and proper attention to the female occupations has got to be paid in any scheme thus evolved.

Following statement gives comparative figures of female earners and working dependents for the Bombay Presidency and Kathiawar.

Unit	Total Principal Workers Females	Total Working Dependents, Females
Bombay Presidency ...	17,17,643	9,89,236
Kathiawar ...	1,00,422	2,23,582
Gujarat ...	4,34,476	7,73,971

While in the Bombay presidency there is roughly one working dependent to two principal workers; in the case of

Gujarat or Kathiawar the ratio falls to about two working dependents to one principal worker.

The following statement gives us the chief female occupations in Gujarat. The actual figures of females engaged under each head and their relativity to 1000 males is also worked out.

Occupation	Number of Females Per 1000 males	Actual Figures
Agricultural Labourers ...	1,441	6,36,326
Forestry ...	101	481
Textiles ...	331	31,290
Basket Makers and other Industries of wood materials, etc.	844	5,013
Rice Pounders, Huskers and Flour Grinders ...	1,979	2,076
Grain Parchers ...	425	88
Washing and Cleaning ...	444	1,876
Scavening ...	573	4,914
Dealers in Dairy Products and Eggs etc. ...	1,693	2,861
Trade in Fuel ...	746	1,154
Midwives, Vaccinators, Compounders, Nurses and Masseurs	974	594
Procurers and Prostitutes ...		109

As it will be easily realised the number of prostitutes in Gujarat is under-estimated. But this is the case generally with all other provinces. This being a low occupation in the public eye affecting the morale of the Society, many prostitutes return themselves as dancers, musicians, songstresses, etc.

NEED FOR AN OCCUPATIONAL CHANGE

The preponderance of agriculture in Gujarat's economy is vividly brought home to us by the above statistics. The occupational returns show that out of the total workers in Gujarat 73 per cent are engaged in the exploitation of animals and vegetation. Sixty four per cent of the able-bodied females work either as principal workers or as working dependents and the rest of the able-bodied females do not occupy themselves in any of the economic activities of the province either due to want of work or geographical inertia. We shall discuss this point in details while studying the present conditions of the existing industries of Gujarat. However, even from these able-bodied 12,08,447 females returned as workers no fewer than 6,36,326 are agricultural labourers. The preponderance of agriculture as well as the existence of a large number of non-workers indicate industrialisation as the urgent need of the hour. Except in the case of textile industries and oil crushing, and, to a certain degree in small industries like metal works, rice and flour mills, etc., factory life is conspicuous by its absence. While each consecutive census shows an increase of population in Gujarat. Hence the number of non-working dependents as compared to the working dependents is steadily increasing. Agriculture in its present state cannot maintain any additional number, therefore, other industrial avenues must be provided for the growing population of Gujarat. Then and then only it would be possible to arrest the growing poverty or the falling standard of living of the people of this province.

PART II

INDUSTRIAL RESOURCES

CHAPTER VII

INDUSTRIES—TEXTILES

GENERAL

BRITISH Gujarat happens to be industrially the most advanced tract in India. Perhaps the greatest business acumen is to be found in this part of India which is rightly known as the province of 'shop-keepers'. Next to it in economic importance stands the territory of Baroda State in Gujarat. The rest of Gujarat is still marking time for its economic regeneration. It is divided into something like 200 separate jurisdictions, the rulers of which fail to join hands to evolve a common policy that will result in the economic prosperity of their subjects.

Some States on the border of Gujarat like Rajpipla, Jambughoda, Devgadh Bariya are no doubt very rich in mineral and forest wealth, but they lack in good transport communications and also in necessary capital to start new industries. Above all, they fail to adopt progressive policy to attract outside capital. They should, therefore, democratize their administration in order to achieve this goal. The States on the north and the north-east of Gujarat are inhabited by very poor and backward people. Nature is to a certain extent more niggardly to them; and, the torch of knowledge shall have to blaze to imbibe people with the new spirit of industrialisation and prosperity. A new move, for the economic and social uplift, shall have to be taken in hand to educate the Bhils and other backward people of this region. For achieving this goal what is needed is the better transport communications, more social contact and above all sound and progressive rule of the Administrators.

According to the Census of 1931 in all in Gujarat 3,50,734 persons are engaged in the industrial pursuits. Of this number 56,457 are working dependents. (For details *vide* Table No. 1 in the Appendix.)

Under the major occupational heads these persons are divided as under :—

Industry	*No. of Persons*
Textiles	1,25,882
Toilet and Dress	53,506
Wood	36,575
Building	15,343
Ceramics	33,011
Metals	15,494
Chemical Products	11,797
Food Industries	10,313
Hides, Skins, etc.	20,905
Furniture Industries	884
Production and Transmission of Physical Force	351
Construction of Means of Transport ...	239
Miscellaneous and Undefined Industries.	26,434
	3,50,734

Among these 3,50,734 the Census further informs us that there are 1,24,125 artisans in Gujarat.* (For details

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* We have calculated this figure by regarding the workers under the following sub-heads as the artisans, viz :—workers in leather, carpenters, turners and joiners, basketmakers, etc., blacksmiths, brass and copperware workers, other metal workers, potters, brickmakers, other workers in ceramics, vegetable oil workers, other oils, grain parchers, sweetmeat makers, other food industries, embroiders, hatmakers, etc. cabinet makers etc., etc. (For details *vide* Table No. 2 in the Appendix.)

vide Table No. 2 in the Appendix.) While the number of workers in the registered factories in 1937–38 is found as under :—

*British Gujarat	95,119
†Baroda State (excluding Amreli and Okhamandal)	23,690
‡Rest of Gujarat	7,000
	1,25,809

Hence the people employed in small scale and cottage industries in Gujarat are : 1,00,800.

LARGE SCALE TEXTILE INDUSTRY: COTTON MILLS

Textiles play a very important role in the economic life of a nation. For, next to food is the requirement of clothing. In India, Gujarat happens to be the important cotton growing tract, and, the principal province that is reputed for the production of special pattern cloths since ancient times. With the opening up of the up country (Northern India) markets by railway construction, the business magnets of Ahmedabad, began to incorporate mill plants one after another, with the consequence that Ahmedabad virtually became the cotton weaving centre of Gujarat.§

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* Figures taken from the Seasonal and Non-Seasonal Factories' Lists.

† Figures taken from the Large and Small Industrial Establishments in the Baroda State, 1936–37.

‡ Our Estimate from the Administration Reports ot the Gujarat States and from the statements collected during our personal investigations.

§ Out of 109 textile mills employing more than 500 persons in Gujarat 88 are in Ahmedabad. As for the rest 16 are in Baroda, 3 in Broach and Panch-Mahals, 1 in Kaira, 1 in Surat and 1 in Cambay.

The position of the organised textile industry in Gujarat is summed up in the following table.‡

	Number of Spindles	Number of Looms	Number of persons employed.
Ahmedabad City†	1,942,286	47,147	74,279
Kaira†	59,028	1,128	2,311
Broach†	51,828	1,174	2,144
Surat	...	...	1,388
Viramgam	49,508	1,187	2,160
Baroda§	3,32,100	7,110	20,200
Cambay¶	...	332	666
	24,34,750	58,078	1,03,148

N.B.—We have included Viramgam figures in this table because the whole taluka geographically belongs to Gujarat.

As compared to the Bombay Presidency and the rest of India Gujarat possesses 25 per cent of all India looms or 50 per cent of the Bombay Presidency looms, and the mill industry in Gujarat employs 25 per cent of all India figure or about 50 per cent of the Bombay Presidency figures. Textile industry is one of the large scale industries of India and as such, its problems can be studied not from the regional point of view but from the point of view of the country as a whole. It is one of the principal industries of national importance, and therefore, deserves a special study.

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‡ As for the quantity of yarn spun :

	Lbs.
Ahmedabad City	195,848,676
Baroda State	33,200,000
Cambay	1,822,533
Total	230,811,290

Figures for Kaira, Broach, Surat and Viramgam are not available, yet the above figures show us that more than 1/6 of all India production is solely manufactured by Gujarat.

† Table computed from the Annual Reports of the Bombay Millowners' Association and Statistics of Cotton, Spinning and Weaving in Indian Mills, 1938-39 figures.

§ 1939-40 Baroda State Administration Report.

¶ 1937-38 Cambay State Administration Report.

But, as this industry has spread itself in the different parts of the country, there are some special problems confronting to it in each of the regions. We note here only such special handicaps of the Gujarat's large scale textile industry which means practically the Ahmedabad Mill industry. We do believe that if these handicaps are removed this industry will profit a great deal. These special handicaps are brought to our notice by those interested in the development of the large scale textile industry and as such they deserve careful attention.

(*i*) Rationalization of the plants is the crying need for the Ahmedabad mill industry. But to make provision for the necessary finance is a problem which every millowner seems to be avoiding. It is so because the Managing Agents are interested in the immediate profits they get, rather than, in curtailing their present profits for the future benefit of the shareholders and their own. If, therefore, the Government intervenes and forces them to start an Industrial Bank in which the millowners should deposit 8 to 10 percent of the profits every year before declaring the dividend, the achievement of the goal will be a matter of years rather than decades.

(*ii*) Another need is of opening up of an adequate number of Industrial Training Schools for the labourers at Ahmedabad. With the philanthropic move from the millowners in this direction much can be achieved at an early date. The third demand of the millowners is about getting the coal at cheaper rate. Herein much can done if they start a joint depot in which adequate supply be stored for the annual requirements of each mill. Most of the mills at Ahmedabad use coal as fuel and hence the problem of cheap fuel deserves greater attention.

(*iii*) As for the evils of Managing Agency System—mostly resulting from its hereditary character—much can be achieved by modifying the Company Law at regular intervals in order to incorporate all the suggestions which are received from the various quarters.

Out of 1,25,882 persons employed in textiles 82,752 are found working in the registered factories that is either in the textile mills or in the Power-loom Weaving Factories in Gujarat. Remaining 42,130 or 34 per cent of the total number, we can easily infer, are those employed in hand spinning and handloom weaving in the unregistered factories.

POWERLOOM FACTORIES

The growth of powerloom factories in Gujarat is comparatively of recent origin. They were started after 1920. There are such 1200 looms* in Gujarat's small factories and to its credit Surat tops as the house of small weaving factories, as it has 46 factories with 1081 looms.

Powerlooms at Surat as in other parts of Gujarat produce coating, shirting and other piece goods for which there is local market. Labour is cheap in the taluka towns of Gujarat and even at Surat (as compared to Ahmedabad), market is ready, for the output is always adjusted to the local demand. The manager or proprietor who runs the foctory employs his capital to a greater extent in the business, keeps the accounts and at times attends the looms. He is, therefore, always diligent and anxious to increase his trade connections, and to establish the name of his firm.

The evils of the Managing Agency System are conspicuous by their absence. Hence these factories, even though they have not made any appreciable progress, have a bright future, and they are likely to decentralise the textile industry to a marked degree.‡

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* Figures obtained from Non-Seasonal Factories Lists, Large and Small Scale Industrial Establishments in the Baroda State, State Administration Reports and from the Statements personally collected.

‡ In Japan the requirements of the home market are met by the powerlooms. However, it should be remembered that when the production of goods like 'Dhotars' is needed in 000's, Textile Mills can produce them with greater economy.

Out of the 46 Weaving Factories at Surat 23 are designated as Silk Weaving Factories.

SILK WEAVING FACTORIES

Surat happens to be the home of this industry in Gujarat. About 23 factories solely devote themselves to the production of silk goods. Silk Khaddar (Gaji), Khans (bodice cloth), Shirtings, Suitings, Coatings, etc., produced by them are finding ready markets in Northern India.

The factory propritors import silk mostly from China and Japan as the Indian raw silk is found comparatively inferior in quality (in strength of the texture), uneven (in thread) and a bit high in price. Added to raw silk, artificial silk yarn, staple fibres, mercerised yarns etc. also have made inroads in Surat factories. For, during these days of depression people demand cheap goods. Counts (yarn) in use in Surat factories are :—Spun silk 60/2, 140/2, 160/2, 210/2, 230/2 ; artificial silk yarn denier 150, 160, 180, 200, 250, 300 and 450 ; staple fibre yarn 30/2, 40/2, 60/2, 80/2. In all raw material worth Rs. 40 to 45 lakhs of rupees (including dye-stuffs-synthetic colours) is required by the proprietors*, hence, their needs of raw silk and mercerised yarn deserves careful observation of the raw silk producers and the yard producers in India.

As for the payment to the factory workers, the proprietors have adopted as far as possible the price-rate system. At the most, a factory worker earns Rs. 12 to 13 per month. If he falters and damages the piece in the process of weaving, he is fined. There is, therefore, the imperative need to establish an Industrial Training School at Surat. This is a crying need when it is realised that the powerloom factories employ here about 6000 workers. To handle the powerloom machinery trained workers are required.

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* For further details *vide* " The Silk Weaving Industry of Surat " by the author published in the Journal of the University of Bombay, January 1942 issue.

The goods produced at Surat are estimated at Rs. 70 to 80 lakhs, while merely the investments in the plants total upto Rs. 20 to 25 lakhs.* Hence greater attention should be paid to develop the markets.

As regards the markets, the Government policy has resulted in giving an upperhand to Japan. Up to 1936 duties on silk cloth imported from Japan were 50 per cent, while on spun silk yarn imports they were 25 per cent. In order to encourage the sericulture industry ('Cosetto' rearing) in India, the Government of India, by this time, levied an additional duty of 14 annas per lb. on spun yarn imports. This was an extra duty over and above the original 25 per cent duty mentioned above†. Moreover, with this increase in the duty on yarn proportionate increase in the duty on silk piecegoods imports was not made. Hence, to this extent protection to the indigenous silk cloth manufactured out of the imported spun silk yarn was lost. Duty on the imported silk cloth remained at 50 per cent, while on imported silk yarn they now worked out at 40 to 50 per cent ; and to weave cloth out of this heavily taxed yarn no longer remained a paying proposition. In addition, to sell it on a competitive basis with the imported silk piecegoods from Japan was well nigh impossible. This measure, therefore, resulted in Japan's favour. She was able to cater for the needs of spun silk cloth of the Punjab, Bengal, United Provinces and Sind markets at the cost of Surat and other Indian centres. As a consequence some of the powerlooms at Surat gave up weaving of pure silk piecegoods while others took more and more to the weaving of art-silk and mixed (silk and cotten) goods.

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* For further details *vide* "The Silk Weaving Industry of Surat" by the author published in the Journal of the University of Bombay, January 1942 issue.

† It should be pointed out that because of the strong representations made by the manufacturers, the Govornment of India felt the need of removing this duty and after giving 3 months' trial to this extra duty of 14 annas, it was removed in the year 1936.

A vivid example of our contention is provided by Mr. J. L. Vakharia, the proprietor of Surat Silk Goods Mill, Salabatpura, Surat. Mr. Vakharia, in the beginning, favoured more the use of raw silk in manufacturing Georgette saris, and of spun silk in making shirtings. However, later on, with the imposition of the above duties on the imports of foreign yarns, he had no other alternative left, but to favour the use of cheaper yarns. The Tariff Board Committee's expectations thus did not materialise; otherwise, more and more factories favouring the use of raw silk would have come into existence, as a result of the protection that was given to the sericulture industry by the Government of India. On the contrary, our findings lead us to conclude that because of this increase in duty and the consequent rise in the prices of raw silk and spun silk, the real or natural silk weaving industry at Surat has suffered heavily, while the production of cheaper substitutes from staple and art-silk has shown an upward trend.

In this connection, it is desirable that duties on the art–silk yarn, etc., be removed, but those on the ready-made goods, whether they are imported in whole pieces or cut-pieces (that is, as 'fents'), be enhanced so as to give encouragement to our indigenous industry and widen the market for our local productions. We, therefore, recommend the immediate removal of duties on the imports of foreign raw silk or spun silk yarns. In order to re-establish the pure silk goods, production to its former position, is an urgent need. Another phenomenon which we observe as a result of the imposition of the heavy customs duties on the foreign imports is the clever devices adopted, especially by the Japanese dealers, to avoid paying more to our Customs authorities. Duties levied on the import of Japanese art silk cloth are 4 annas per square yard, while if the cloth is imported in cut–pieces, and not as a whole piece, only 35 per cent *ad valorem* duties are to be levied. Hence considerable imports of art-silk cloth take place as 'fents'.

OUR RECOMMENDATIONS

As regards raw materials: (1) Loss in degumming is greater in case of Indian silk than in the case of Chinese or foreign silk. Hence, improvement in the quality of the 'Cosettos' reared is urgently required. The Government of India should, therefore, see that the latest scientific methods are resorted to by the 'Cosetto' rearers in their efforts. 'Cosetto' rearers ought to be kept well informed about the research work carried on in this direction in other countries.

(2) The age old complaint that Indian silk is difficult to wind still persists. It is so because the Indian silk when re-reeled shows that the thread is uneven. This complaint is growing in proportion and due to this unevenness of the Indian thread, many breakages occur while warping, weaving or doubling.

We, therefore, suggest that sorting and grading ought to be done by the silk producers, failing them, by the silk merchants; this will definitely result in more demand for Indian silk.

(3) It is also desirable to give proper deniers to silk and to open testing centres at each and every silk producing centre in India. With regard to this our recommendation it has got to be pointed out that even after so much of pressure from Mr. P. B. Advani, Director of Industries, Bombay, no such steps have been taken either by the Government of India or by the silk producers.

As regards the technique: (4) We have already pointed out that dyeing of yarns is done by hand process at Surat. There is, therefore, a great need for a complete Dying, Bleaching and Finishing Plant at this centre. As a large quantity of cloth is sold at present in an unfinished or partly finished condition, the producers do not receive the proper price. Even for producing partly finished goods, the process at present resorted to is costly and defective.

About, the necessity of the above plant Surat manufacturers have laid a great stress. The plant in all will cost about Rs. 60,000 to 70,000. The Government of Bombay can lend some money in this enterprise and can also help by making expert advice available for the working of this plant. Manufacturers at Surat are convinced about the success of this plant, and on close inquiry we learn that if the Government of Bombay take the initiative, private parties will immediately respond to their call. They will at once come forward to help the enterprise by purchasing the shares and by giving full guarantee to the Government to repay all the money by instalments as they become due.

Establishment of this plant will help a great deal in co-ordinating the work of the small factories of Surat. Fast-coloured finished goods thus prepared will find ready markets everywhere in India; and they will be able to successfully withstand the competition of the gigantic concerns of India indulging in the production of the same quality goods.

In connection with the labourers : (5) The Surat Weavers' Association has made representations several times to the Government of Bombay requesting them to open up an Industrial Training School at Surat, which can train the workers to handle the powerloom machinery. There is a dearth of such efficient or trained workers at Surat. It being so, as we have already pointed out, weavers often damage the piece in the process of weaving due to their sheer ignorance in handling the machinery. They also take a good deal of time to adapt themselves to the requirements of the powerlooms. It being so, in the beginning they are, therefore, fined for the damage they do in weaving a piece of cloth. Under the circumstances they hardly know how to handle the Jacquard, etc. Being illiterate and backward these workers are unable to draw the attention of the Government to their immediate need, and we hope the Government will at once make a definite move through the Department of Industries to meet this longfelt need on all sides. As Surat is a growing centre of powerloom factories the need is all the greater.

As for marketing: (6) A good Sales Organization to supply information regarding the important markets where the goods can be disposed of should also be set up at Surat. The Silk Weavers' Association can be useful in this connection.

(*a*) It is stated by the handloom weavers that formerly Surat's silk goods were sent to Rangoon, Morocco, Arabia, Africa and other distant places. Every week goods worth Rs. 20,000 were despatched from this city to the above mentioned places. Hence, it is desirable to observe carefully the possibilities of regaining these lost markets.

(*b*) Information about developing the overseas markets should be gathered by this organization, and also all the avenues to extend the interior markets in India should be explored.

A proper directory of the important markets and the influential merchants therein, should be compiled and this should be made available to Surat manufacturers.

(7) More attention should be given to the designs and the patterns in the production of silk goods and to advertise the same in the important markets of the world. Some of the specialities of Gujarat like Bandhanis, Patolas, Mashru and Tanchhoi have lost the markets and become out of vogue because of the absence of the required efforts in this direction by the illiterate weavers.

'Tanchhoi' of Surat will find an easy outlet in the western countries if modern business practices like window showing, etc., are resorted to in those markets.

As for the Government of India: (8) Duty on raw silk and spun silk yarn imports should be immediately removed.

These are the important raw materials required by this industry, and the sericulture industry of India is still not so developed as to meet all the demands of this industry. These duties, therefore, make it impossible for the weavers to purchase the foreign raw silk or spun silk at such top rates as they have to withstand the foreign competition in ready-made goods. As a result, the production of pure or real silk goods is neglected more and more, and the production of staple fibre and art-silk goods is encouraged.

(9) In order to give fillip to the indigenous silk weaving industry, the Government of India should impose prohibitive duties on the imports of pure silk, art-silk or mixed (cotton and silk) goods, as well as on the imports of Japanese 'fents'*.

Above are some of the suggestions which strike us. If on the lines of the Sales Organization, as suggested above, a separate Raw Materials Purchase Organization is created, it would be of great advantage to the Surat manufacturers. However, this presumes unity amongst the Surat producers. The Surat Silk Weavers' Association should, therefore, strengthen its hands, and must achieve a status whereby it can dictate its policy, and issue regulations for the careful observation of all the factory owners. Unless a spirit of active co-operation is shown by the Surat producers, this idea will not materialise; and, in the absence of such unity, already existing evils like internal jealousy, competition, etc., are bound to gain ground. These unhealthy tendencies, therefore, need to be nipped in the bud.

HOSIERY FACTORIES

There are at present 8 hosiery factories at Ahmedabad employing in all 1497 persons. A decade or two ago needs of Gujarat were mostly supplied by Japan and, no hosiery factories were existing in the province. That Ahmedabad is the only centre important in the Bombay Presidency for hosiery weaving will be easily realised when it is learnt that the other 6 hosiery factories in the Bombay Presidency are very small, and, they employ in all 283 workers.

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* Japan is no longer a competitor after the out break of this war and foreign imports of these goods have at present been practically nil.

Ahmedabad hosiery factory owners complain about the inferior quality of Indian silk and wool. They produce mufflers, socks, hoses, etc., from cotton, silk and woollen yarn. They import silk and woollen yarn from foreign countries. Hence there is urgent need to see that the quality of Indian silk and wool are improved; and, side by side with silk worm breeding, sheep breeding is also given impetus so as to assure better quality wool. There is still room for the production of hosiery goods in our factories as still the foreign imports of the Bombay Presidency in hosiery stand to Rs. 18 lakhs.*

HANDLOOM WEAVING

From the statements gathered from different quarters, and by our special inquiry we are able to prepare the following estimate about the existing handlooms in Gujarat.†

British Gujarat	2500
Baroda (excluding Amreli and Okhamandal)	1500
Rest of Gujarat	3500
	7500

While tackling the handloom weavers it was found out that their number is declining year by year. These handloom weavers are illiterate and in the scattered villages of Gujarat they mostly weave rough khaddar (gaji). All of them feel the competition of mill cloth in the varieties they produce.

SILK WEAVING

Of the silk weaving centres the most important are Dholka, Surat, Ahmedabad and Patan. Weavers at Dholka weave fine count saris together with pure jari (Tasa) borders. With such jari borders mills found it impossible to weave the cloth as with the slight jerk 'jari' used to break. But the Ahmedabad dealers began to purchase mill-made plain saris of fine counts, and to get the 'jari' borders stitched over them by the tailors. This worked out cheaper, and resulted in the decline of the demand for the Dholka saris.

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* Figures for the year 1938.

† For details *vide* Table No. 3 in the Appendix.

Most of the workers at Dholka are outworkers. They get raw materials, yarn, etc., from the merchants on credit and in return sell the saris to them. As the demand has declined out of 600 looms at Dholka only 335 are working at present and hardly the weaver earns Rs. 9 to 10 per month. At times he remains unemployed.

KHADDAR SILK (OR RESHMI GAJI)

At Surat there are 75 gaji weavers. Usually the weaver makes 'gaji' (silk khaddar) of 27 inches width, and, he is able to weave only 2 yards per day. To finish the piece of 70 yards takes 1½ months, for which he obtains Rs. 20 from the local merchant. Hence hardly he earns Rs. 12 to 13 per month. Most of the 'gaji' weavers of Surat are out workers. Before the advent of powerlooms they relate that they were earning Rs. 20 per month; while in the heyday of handlooms their income was Rs. 50 per month. Competition of powerlooms has, therefore, resulted in the reduction of the remuneration of gaji weavers.

PITAMBERS

Pitambers were made on handlooms at Ahmedabad, Surat, Baroda and Patan. But because of the decline in the demand of the 'pitambers' due to change in the public taste and customs, now hardly a dozen 'pitamber' weavers are, at Ahmedabad and Patan. There is no possibility reviving their demand. Moreover, the art-silk pitambers produced in Bhiwandi and other powerloom factories are more favoured as cheap substitute by the customers. But, as for Tanchhoi weaving (Surat's speciality), Mashru weaving (Ahmedabad, Patan and Surat once noted centres) and Patola making (Patan's speciality), it can easily be said, that the decilne in their demand is solely due to the lack of efforts on the part of the authorities to popularise them at suitable centres.

"RESHMI TANCHHOI"*

"Reshmi Tanchhoi" was once the speciality of Surat. With the help of wooden dies Surat weavers used to impress or print the silk cloth on one side, in order to add to the beauty of the cloth. Designs of elephants, lions, etc., were impressed on the cloth, which were not only very popular in the Indian markets, but had also gained a footing in foreign countries. During the days of depression the Indian markets were lost, while no contact with its foreign markets was maintained because of the negligence of the traders. Hence there remained no demand for this special pattern of Surat and hence it is no longer produced at Surat. If proper guidance as regards designs is given to these weavers, and special measures are adopted to popularise its use in the foreign countries, Tanchhoi weaving can be revived.‡

PATOLA WEAVING

If "Tanchhoi" was the speciality of Surat, the Patola weaving was and still remains the speciality of Patan. There were something like 700 Patola weavers (weavers of hand woven picturesque fast coloured and designed silk saris) in Patan. However, today only two families know this art.

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* Making of a special pattern silk cloth.

‡ *Reshmi Tanchhoi* weaving was also carried on at Dhenap (ધેણુપ) in Visnagar Taluka. But as the depression overtook this industry, gradually the artisans began to give it up. By about 1936 only two families were engaged in 'tanchhoi' weaving and at present at this centre this industry is practically extinct.

To study the art of Patola weaving requires something like six years. To make 3 patolas of six yards and of 51 inches width takes 2½ months to two artisans. Every thread has to be dipped in a different colour and that too, upto a particular length, so that, the required design of the elephant, lion, etc., can be obtained. The process, therefore, is very labourious. As there are very precious saris their demand has fallen and these two families at Patan hardly get enough orders to make both ends meet. They are able to sell only 25–30 patolas a year.

Patolas were used for window curtains by the Kings in India and they were even in demand in foreign markets. Because of the mills' cheap goods, and the change in the public taste (with which the old designs did not fit in) and also the dearness of this product, patolas lost their markets. Hence they require patronage of the rich in India and, propaganda in foreign rich cities, and also, radical change in their designs to suit the modern taste.

RESHMI SUJJANI

Reshmi Sujjani making is the speciality of Broach weavers. Without a single stitch cotton is filled in while weaving the cloth. Hence to a layman this craft is like one of the seven wonders of the world. Even to their daughters the sujjani makers do not teach the art of sujjani making. It is their trade secret which they do not divulge to anybody. A decade ago the Japanese and other foreign travellers who happened to visit Broach used to purchase these 'sujjanis' for presenting them to their friends and relations.

However, today there are only two families who prepare such 'sujjanis' and it seems that with their death this art will also die out from Gujarat.

The loom on which they weave the Sujjani costs Rs. 100, and upon it within 4 days they can make 6 feet by 8 feet sujjanis with raw materials worth Rs. 12-12-0 (Rs. 12 worth silk and As. 12 worth Broach cotton), 25 years ago they used to earn Rs. 40-50 per month from this industry. But today they hardly get Rs. 20-22 per month. As for the fast colours, durability, etc., of these sujjanis, there are no two opinions. They are even given in heritage to the new generation, as they last for 20-25 years. What they need is propaganda in rich countries where there may be a demand for such articles. With a little bit of effort in this direction in foreign centres, they will surely find a ready market for sale.

MASHRU WEAVING

Mashru cloth means the cloth in which, during the process of weaving, cotton threads go below and silk threads come up on the upper side of the cloth. Hence it is mixed cotton and silk cloth, and cheaper if compared to pure silk product. In the production of mashru cloth, artificial silk, pure silk, mercerised cotton and gul are required. For galechas, pillow covers, etc. Mashru cloth was used by rich families in by gone days. Today, however, at Ahmedabad Mashru weaving is practically extinct, while at Patan there are still about 500 looms producing Rs. 2 lakhs worth mashru per year. At Patan, as these handlooms are immune from factory legislation, hence workers can work for more hours and as the standard of living is cheap and hence labour is cheap, this industry still persists on hand basis. Hardly a mashru weaver now earns Rs. 10 per month. All these mashru weavers at Patan sell their mashru cloth to the Khatri and Jain merchants of Patan. There are at Patan about 1½ dozen merchants in all who purchase this cloth.

As mashru weaving is already introduced in Surat powerlooms, where goods worth Rs. 50,000 to Rs. 60,000 are produced every year, and the Patan Weaving Factory has introduced the same at Patan very recently it seems that the number of handlooms weaving mashru cloth will decline; and that this industry will run on machine basis in near future.

Lastly in silk weaving, there are half a dozen Silk Weaving Handloom Factories at Nadiad. The owners of each of these concerns run 25–30 looms, and employ the weavers on piece rates. The weavers get about Rs. 9 to 10 per month, while the proprietors on an average earn Rs. 4 to 5 per loom by way of their profit for organisation and interest on the investments, etc.

However, these handloom factory owners have of late preferred to produce cotton and silk mixed goods by using gul, stapple yarn, mercerised yarn, art silk, etc., instead of pure silk shirting, suiting, coating, etc.

WOOL WEAVING

Wool weaving has deteriorated to a deplorable extent in Gujarat. Once its welknown centres were Khapariya, Kadod, Hasuka and Vegam (Surat District); Broach, Limdi (Panch Mahals); Champaldhara (Bansda State); Sami (Radhanpur State); etc., etc. However, as the machinery was introduced in foreign countries in the production of woollen cloth and improved methods were adopted there, for refining the wool, the better quality, cheap, attractive and very smooth foreign rugs and blankets made inroads in the Indian markets. Consequently this unorganised village industry has suffered heavily in demand.

Today the Gondhs and the Gadariyas everywhere complain about the loss of their occupation. About 20 Gondhs (untouchables) are engaged in wool weaving at Khapariya, 15 at Kadod, 14 at Hasuka, 7 at Vegam, 5 at Broach, 10 at Limdi, 7 at Champaldara. However, of all the blankets and jarris (Kāmal and Kānchvās) Limdi's blankets are of the better quality. At other centres woollen blanket weaving has become more or less a side occupation as the weavers also operate in the fields.

In addition to their looms, other implements required by the people are 'rās', 'rāndhvā', 'nāla' (shuttles), 'kuchado', etc. They are hardly worth Rs. 10, while the loom costs Rs. 20/-.

However, more time is taken in spinning the wool and in preparing the hanks from the spun wool. Family members help in these processes.

To make 5 hath by 1¼ hath 'kāmal' (Dhābli) two artisans take 4 days and hardly they earn Rs. 8 or 9 per month at Limdi. The weavers at Broach prepare very rough 'kāmals' of 3½ hath in length by 1½ hath breadth (i.e. about 2½ yds. x 1 yd.) upon a loom (worth Rs. 5) and they earn Rs. 7/- per month. 2 days are taken for spinning, and one for weaving this piece which requires 4½ seers of wool. For sizing material they use 'Pānkado'. These very rough 'kāmals' are required by the calico printers of Ahmedabad for ink pads.

Pullovers of Limdi, jersies of Khaparia and ink-pads ('kāmals') of Broach require to be organised on a better footing. These weavers feel the competition of foreign rugs, soft blankets and woollen piece goods against which they require protection. In addition they need the guidance in the improvement of their technique; and all the more urgent is the improvement in the quality of Indian wool. Hence lamb breeding deserves greater attention and encouragement. If proper steps are taken in this direction 'kāmal' and 'kānchvā' weaving will show considerable expansion throughout Gujarat.

WOOLLEN GALECHA

Woollen Galecha weaving or woollen carpets weaving was carried on in Ahmedabad, but because of the reduced demands it is now practically given up. Only seven or eight looms are there at this centre which do not work throughout the year. Still the 'galechas' of Surat Balashram deserve special mention. They are of fast colour, picturesque, and attractive. The artisans (the orphans of the Ashram) impart the live expression of their soul to these galechas, on which historical scenes, and characters, are impressed with great *exactitude.* These 'galeçhas' (carpets) are costly and hence deserve support of the rich. This is one of the best centres of India that can take pride in its art of carpet weaving.

TAT WEAVING

Tat weaving means Jute or hemp carpet making. The tats are made at Katwara (5 weavers) and Chandwana (10 to 12 weavers), and at few other centres in Panch Mahals.

The weavers purchase raw material hemp at Rs. 2 for 32 seers. During cleaning about 8 seers are lost as waste; and a family requires about 3 days to prepare 3 strips of carpets 9 yds. x 8" each. These narrow strips, are, stitched together and the complete carpet is locally sold for Rs. 2-10-0. Of the 24 seers hemp only three 9 yds. x 8" tats can be prepared. As cost price is Rs. 2-0-0 only 10 annas profit is made after 3 days' work. Hence monthly income comes up to Rs. 6/4/- per family. If proper guidance is given to these artisans and looms of more than 8" width (say of 1½ ft. or 2 ft. width) to suit the weaving operation of these weavers could be found, these carpets can be of use to cover the cricket ground or to spread on the stair case. In the absence of proper guidance and market, tat weaving is rapidly declining in this part of Gujarat.

A few people in Panch Mahals also prepare ropes from hemp. They get 2 annas for working 10 hours. Hence they are unable to earn their livelihood from rope making. These weavers should, therefore, be taught the art of preparing better types of carpets, as also mattings and gunny bags.

COTTON WEAVING

WEAVING FROM MILL WASTAGE YARN

Weavers at Vadtal and Karamsad and at few centres in the Ahmedabad District like Sarkhej, use mill waste yarn in weaving fine saris. They purchase the bobbins of waste yarn and prepare the goods and sell in the adjoining markets. As such 40 looms of Vadtal, 12 of Karamsad and 7 of Sarkhej seem to be working satisfactorily. These independent weavers are found to be comparatively better off than their fellow brethren elsewhere, as with cheaper yarn and with their own investment they easily earn Rs. 12 to 13 per month. They prepare mostly saris, towels and rough khaddar. However, there is a limit to the availability of the mill waste yarn and sometimes they complain that they do not get it in enough quantity.

GHAGHRAPAT & SARI WEAVING

The Bhavsar females at Borsad (40 looms) make " ghāghrāpāt " (petticoat) cloth, and, sell it to the local dealers. For the 'ghāghrāpāt' (women's garment) the weaver gets annas 12 on each piece of 24 yards x 31". Hence a weaver who works for 8 hours a day earns nearly Rs. 7 to 8 per month. This pattern does not find local market at Borsad. But the dealers to whom these outworkers of Borsad (Bhavsar ladies) sell the cloth, find markets in Thasra, Dakor and Umreth side of the Kaira District; and they are also able to sell some cloth to the 'Dublā' females of the Surat district. The same is the case with Khatri females of Broach (101 looms) who prepare saris. Their special pattern suits the requirements of the 'Kali Paraj', 'Rani Paraj', and the 'Dublā' communities of Gujarat. As their products do not find local market, they sell their handloom products to the Broach dealers, and get remuneration on piece rate from them. Thus all the khatri females are outworkers in Broach. Added to Broach, we find Gandevi (125 looms), Mandvi (43 looms) Bulsar (50 looms), Bardoli (70 looms), Chikhli (33 looms) mostly engaged in the preparation of cotton saris to suit the requirements of these backward tribes. Their saris are worth Rs. 2-8-0 to Rs. 2-12-0 to at the most Rs. 3-4-0 and are known as 'Chargoti' 'Samsuri' or "Sum sali" (Bharam Lilā, Bharam Bhurā, Bharam Lāl), or 'Dānākor' or 'Chasmāi' (Bharam Lilā, Bharam Bhurā, Bharam Lāl), or 'Pātikor Rāstā' (Bharam Lilā, Bharam Bhurā, Bharam Lāl). These saris are 5 yds. x 44" or 45" and 3 days are taken to make one sari. However, now the plain mill saries with printed ends are available at Rs. 1-8-0 or Rs. 1-12-0 to Rs. 2-4-0 or Rs. 2-8-0 and they are fast coming into vogue among these females of backward communities, hence, in future the demand for handloom saris is bound to be affected adversely. Moreover, the weavers on Mandvi side already complain about the competition they feel from the products of Bhiwandi, Ichalkaranji, Sangli and other outside centres, which implies the competition of powerloom factories.

Cambay (2088 looms) has concentrated mostly on preparing "Cambay" or "Khambhati Saris", better known as 'Daxini Saris'. Chief markets for these saris are Poona, Sholapur, Hubli, Dharwar, Nagpur and Bombay. As the markets are away from this locality, almost all the Cambay weavers are out workers. Generally the weaver prepares a sari of 16 hath x 50" in 4 days. He gets Rs. 1-6-0 to Rs. 1-8-0 by way of remuneration. Hence, his monthly earning is of Rs. 10 or 11.

Cambay weavers also complain about the increasing competition that their dealers are finding in their above markets from Ichalkaranji, Bhiwandi and Sangli. About Rs. 5 lakhs worth saris are even today exported from Cambay every year. Hence this industry deserves all the attention of the authorities concerned.

'THOBH' & 'JAJAM' WEAVING

Just as 'Khambat' or Cambay is known for its Daxini sari weaving, in the same manner Kanodar (Palanpur State) was once known for its special pattern known as "Thobh". 'Thobh' cloth was favoured as cotton pullover (head-wear) by the Arabs. This cloth, therefore, had a market in Abyssinia. The cloth is prepared in 4 pieces of 3¼ yds x 30", and all the four pieces of 13 yds x 30" used to be sold at Rs. 1-4-0. The Italian Government levied prohibitive duties on their imports in Abyssinia and by 1936 that market was lost to the Kanodar weavers. About 300 looms were weaving "Thobh". Some of these looms, therefore, have taken to prepare saris of 5 yds x 45" or 46" of Mandvi and Chikhli type. These weavers can prepare a sari of 5 yds x 46" in 3 days, and, they earn Rs. 8/- per month.

Sari weaving got impetus at Kanodar only when the "Thobh" weaving was given up. The other important pattern for which Kanodar is famous is the making of cotton bed as well as cotton pillow covers (Godadā Bharvāni Jājam).

On their 60 yds 'Tani' they can weave 12 yds x 56" bed cover cloth per day. They use 2/20s and the 15 Ratal packet (1½ packet) costs Rs. 7-14-0, while the colour costs Rs. 1-8-0. Rs. 9-6-0 is the cost price by which 60 yds x 56" cloth is prepared by the weaver within 5 days. Selling price of this cloth is annas 3/- per yard, which comes to Rs. 11-4-0. Hence the weaver gets Rs. 1-14-0 by way of labour charges. If, therefore, 2 days' time in filling the bobbins and preparing the tani, etc., is taken into consideration he gets Rs. 1-14-0 at the end of a week. His monthly income, therefore, comes to Rs. 7 to 8. Out of the 600 looms at Kanodar, about 400—450 are concentrating on this pattern, and, they sell their 'jajam' cloth and saris by wandering as paddlers from village to village in Nadiad Taluka, Charotar or Kathiawar side; and even the Navsari, Bilimora, and Palanpur merchants come over occassionally to Kanodar to purchase their cloth.

LUNGI, 'SARAGIA' & 'SUSI' WEAVING

Among the important patterns of Gujarat which have lost markets and hence are given up 'Thobh' cloth stands first. Secondly the market is lost for the 'Lungi' cloth which Mohamedans are used to tie as the Dhotars round their waists*. At Surat only few lungi weavers are working at present, and hardly one or two at Ahmedabad. Formerly Lungi cloth worth thousands of rupees was exported to Arabia especially to Mecca and Jeedah from these Gujarat centres. However, it seems that lungi weaving is now introduced at the centres of our export or otherwise textile mills are providing lungi cloth at cheaper rates to those markets. The third variety that has lost market is the 'Saragia' cloth. Kanodar 'Saragia' cloth is used as 'Khes' (to cover both the shoulders of a male) by the Arabs. Hence either weaving of this variety has taken place in Arabia or else Bombay, Kurla or Bhiwandi textile factories are now providing this cloth at cheaper rates to Arabia; any how, the Kanodar weavers do not find any demand for this cloth during recent times. The fourth variety is the "Susi" cloth, mostly favoured by the Bohra community for preparing pants. Only one weaver at Zalod now prepares this pattern. Lastly, we find that the "Kalu Kapad" or "Black cloth" of Cambay which was used as "Lungi" by the Mohamedans, finds no market at present. It used to be exported to Mecca, Jeedah and other centres of Arabia in the past.

RAJJAI WEAVING

If Kanodar is known for the making of bed and pillow covers, Broach is known for its cotton Rajjai weaving. There are at present only 10 "rajjai" makers at Broach. This industry has fallen on evil days and almost all the families have taken to carding as their principal occupation.

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*Madras used to meet the 'Lungi' requirements of India, and, also of Burma till its present occupation by the Japs.

The woollen blankets and rugs act as cheaper substitutes hence the market for "rajjai" is curtailed day by day. For making a rajjai 2½ yds x 1½ yds, 3 lbs of raw cotton (Rs. 0-10-6), 5 yards of ordinary cloth (Re. 1-0-0), 5 yards of fancy cloth (Rs. 2-11-0), and colour (Rs. 0-10-6) are required. With Rs. 5 cost of the raw material they take 3 days to prepare one rajjai (in sewing, etc). Selling price of this better quality rajjai is Rs. 7 to 7/8 and such 6 or 7 rajjai can be prepared per month. At the most the weaver earns Rs. 12 or 13 per month with the help of his family members, while carding brings Rs. 15/- per month. To-day hardly Re 1-8-0 they get for stitching the rajjai when the raw material is provided by the customers, while eight to ten years ago they used to get Rs. 3/- for stitching which they could finish in 3 days. So their income has fallen by more than 50 per cent within the last decade.

MAST MAKING, CARPET MAKING, ETC.

At Bulsar (Surat District) there are 25 looms engaged in preparing the mast ('Shadha') cloth for the country crafts. This cloth is better known as 'Vahāna Ni Bori' (cloth for country craft). The condition of these people at Taiwad is not better than those of their fellow brothers who weave cotton saris at Bulsar for the 'Kanabi' 'Patidar' and 'Koli' females. They earn Rs. 7 to 8 per month, and, complain that as the trade in country crafts is fast declining the number of weavers is also going down every year. For cotton carpet weaving we find Cambay to be a good centre in Gujarat as about 10 weavers are engaged in this industry. Of other centres only at Narsanda (in Kaira District) there is one weaver. These cotton carpet weavers require 2/6 yarn at Kambay. Two weavers take eight days to prepare 12 ft. x 7 ft. carpet for which Rs. 4 cotton yarn and Rs. 2 worth colour is required. The local dealer purchases this carpet at Rs. 14, leaving Rs. 8/- as labour charges for two weavers per week. Hence they get hardly Rs. 11 to 12 per month. About 50 to 75 carpets are exported to Jeedah

(Mecca) every year. As for the carpet weaving it is not out of place to point out here that in most of the Central Jails of the Gujarat States it is taught to the prisoners, and hence cotton carpet weaving happens to be one of the jail industries of Gujarat. Lastly leaving aside the special patterns, we would like to study the conditions of the rough Khaddar Weavers better known as 'Gaji' weavers in Gujarat. These Gaji weavers prepare 'Pāghadi' (head dress), 'Pichhodi' (bed cover), 'Kachhota' or 'Langot' (bike or suspender), 'Thepādā' (rough petticoat cloth), etc. These are the varieties which the weavers (or 'Vankars') make in the scattered villages of Gujarat. However, to study their condition Kholvad, Magna (Baroda), Chaloda (Dholka Taluka), and Garbada (Panch Mahals) are the suitable centres. In our inquiry we found that these weavers hardly earn Rs. 6 to 7 per month, and that their products are favoured by the shepherds (Bharvads), the 'Thākardās' and the 'Bhils' of Gujarat.

COTTON TAPE OR 'PATTI' MAKING

Throughout Gujarat we find mostly Ravalias ('Dhed garodas' or Gurus of Dheds) weaving cotton patties. Their remuneration is very low. Hardly they earn Rs. 4 to 4-8-0 per month. They, therefore, live on the alms from their community members ('Jajmāns').

Wooden cots are found to be inconvenient in the towns and cities, for they occupy more space. Hence with the rise and growth of urban areas demand for cotton patti has greatly fallen. This has adversely affected even the important centres of Gujarat. Kanodar (Palanpur State) once known for its cotton patti is no longer remembered today, and, even in the present important centres we find comparatively few weavers engaged in this industry.

Following is the number of weavers at the important centres of Gujarat :—

Valam (Boroda State) 50, Umreth 40, Radhanpur 30, Rajpipla 25, Ahmedabad 20, Nadiad 20 and Kanajari 19.

Patti looms (or 'Akhādās') are of very small width. These weavers purchase mill wastage yarn at Rs. 8–8–0 per maund and prepare hanks to get the thread ready for weaving. This takes one day and in the process of preparing the hanks they find about 4 to 5 seers wastage. Out of 36 seers yarn they prepare 4 tanis of 9 seers each. Two days are taken in preparing the tani and 2 days for weaving. Hence after 5 days 9 seers patti (for which the dealers are prepared to pay Re. 0–6–0 per seer) is ready. The cost is Rs. 2–2–0, while the selling price, is Rs. 3–6–0 leaving Re. 1–4–0 as the remuneration after six days' 8 hours' strenuous effort. Hence these people earn from patti weaving at the most Rs. 5/– per month. The demand for 'patti' is likely to fall and hence it is not possible for us to suggest ways and means of developing its market. However, if improved technique is provided to these Gujarat patti weavers, with better looms—better equipment, they will surely be able to earn something more.

CLOTH BUTTON INDUSTRY

Vapi, Borsad, Kapadvanj, Visnagar and Radhanpur are the important centres of this home industry. In all about 125–150 females are making cloth buttons at these centres.

These buttons are made from old rags from Re. 0–0–3 worth rags and 0–0–6 worth thread 16 dozen buttons they make at Kapadvanj. By 8 to 10 hours work they can make at the most 40 dozen buttons which they sell to the local dealers and the tailors for 2 dozen per pice. Hence from Re. 0–5–0 worth buttons if the cost of rags and thread (Re. 0–2–0) is deducted they earn 0–3–0 per day. How-

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N. B.—For towels and coating we still find handloom products being favoured by some of the public. Hence we find at Ankleswar, about 8, at Visnagar 3, at Umreth 1 and at Zalod 1, in all about 15 to 20 handloom factories in Gujarat. Proprietors run some 10 to 12 looms on piece rate in these factories and earn their livelihood by narrow margin of Rs. 2 to 3 per loom.

ever, as anybody from the family even a boy or a girl help in preparing buttons they are ready to prepare more buttons provided they can sell them. As they have also to attend to other domestic work they augment the family income by Rs. 4 or 5 per month. But if they devote solely to button making they do earn Rs. 5 to 6 per month.. Borsad buttons are superior to those of Kapadvanj, while at Vapi Kasab (gold thread) is also used in making the khaddar buttons. They are, therefore, of the best quality, and are sold 16 for 1 anna to the tailors. About a decade ago these buttons fetched double the price which practically meant double the remuneration to these workers. As the machine-made cheap buttons are imported increasingly, and, the taste for khaddar or cloth buttons is fast declining, their margin of remuneration is also adversely affected and their market is also reduced.

The button makers are of opinion that their industry can be developed only if sufficient publicity is given to their products, and, people are encouraged to buy *swadeshi* goods.*

ROPE, TWINE, STRING AND OTHER FIBRES

The census reports show us that 4,104 persons are engaged in making these products in Gujarat.

Important centres for this trade in Gujarat are :—

Ahmedabad	966
Palanpur	934
Surat	477

Making of rope is mainly a rural industry. However, for coir rope making, we find Ahmedabad, Broach, Hansot and Surat to be very important centres. In all about 500 'Khārva' or 'Khalās' females are engaged in this industry.

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*Some social thinkers on this side are of the opinion that this female industry should be protected and encouraged by the Government at all costs. For as long as widows as a class exist in society, this industry brings good remuneration to them and they have not to expose themselves to the society. Handgrinding, cardboard box making, paper bags making, patrala making are some of the industries which they enumerated to us.

Their husbands do either fishing or odd work like readjusting the roof tiles before the rainy season etc.

The.process of making the ropes by hand is very simple The cocoanut husks are first soaked in water for about 2 days and then hammered in order to remove the outer covering. The fibres are then separated and dried. They are then twisted by hand and ropes are prepared. For making a rope 30 feet in length 2 days are required for twisting. The cocoanut husks are locally purchased at the rate of Rs. 4 per thousand. The rope of 30 feet length is usually sold to the local dealer at the rate of 3 to 4 annas. The income of a rope maker hardly exceeds Rs. 3 per month.*

The rope makers of Gujarat are not aware of the twisting machines in use in Travancore and Cochin. They simply grumble that cheap ropes are making inroads in Gujarat markets and that they are unable to withstand their competition. If these weavers are supplied such twisting machines (of Rs. 25–30 worth), they will not only be able to earn more remuneration, but the market for their product will also widen.

In other centres farmers themselves make the ropes required for their agricultural operations. However, Borkheda in Panch Mahals is a centre where 'Bhindi' or 'San' ropes are made. About 500 'Bhils' when relieved from agricultural operations engage themselves in this industry. They also make 'Jotar', 'Nara', 'Gofan', 'Mhora', 'Mod', 'Athur', 'Pala', 'Poth', Chhalka', 'Shikka', etc., required in the cart transport or for pack bullocks. Their economic condition is far from being satisfactory. They hardly earn Rs. 4 per month from this occupation; but in the absence of any other avenues of life these illiterate people, with their simple habits and poor standard of living, cheerfully pull on with what they get; and they earnestly appeal for encouraging the cart-transport. Like their fellow brethren on Jambughoda side these weavers also make 'Chapadia' Cloth 4 'hath' x ½ 'hath' which is required in the villages immune from oil crushing ghani. There the farmers powder 'doli-' seeds (Mahura seeds); put the powder in a piece of cloth and hold it in the boiling water in order to allow the powder to soak the steam. This moist powder is then put in the 'Chapadia' cloth and the cloth is then twisted in order to press the powder and extract oil. The remuneration from weaving the 'Chapadia' cloth is not much. Neither it is more in demand nor it forms the main product of any weaver on this side. These weavers earn Rs. 4 per month. On Idar side we find the 'Bajanias', the 'Vanjaras' and the 'Ravalias' meeting these demands of their localities.*

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*The waste dust ('Bhuki') they sell to the aerated water factories at annas 4 to 5 per maund; while the useless material they use as fuel.

DYEING AND CALICO-PRINTING

The census returns show that 4,613 are engaged in dyeing and printing cloth and in other occupations connected with the preparatory processes of textile manufactures. They also give us the clue that Baroda Division (1339), Mehsana Division (629), Ahmedabad District (531) and Palanpur (371) are the important zones around which these activities are mainly centred.

As for dyeing we have ample proof that when indigo colours were in demand and synthetic colours were not invented, Broach District was the home of that industry in Gujarat. However, with the introduction of dye-works in the textile mills‡ these dyers ('rangrejs') were relieved of most of their work and hardly we find them in clusters in any part of Gujarat today. Every big town† claims 2 or 3 dyers who practically dye the old clothes or the light coloured cloth when its colour has faded out due to wash.

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*At Deesa and Dhenera (Palanpur State) few Jat families are engaged in making "Bhakhal" from camel's hairs.

‡Separate Dyeing and Bleaching Works have also come into existence in this connection.

†Dyers are 6 at Radhanpur, 4 Idar, 4 Palanpur, 1 Sami, 3 Nadiad, 1 Anand, 1 Borsad, 1 Karamsad, 4 Broach, 2 Jambusar, 4 Dahod, 4 Zalod 1 Pardi, 7 Vapi, 3 Bardoli, 2 Rander, 15 Surat, 49 Ahmedabad, etc., etc.

However, as long as the handloom weaving persists there will remain some demand for the dyers to dye the handwoven white cloth (gaji).

Calico Printing: Later on, calico-printing plants came to be introduced in the textile mills, and their introduction gave a severe blow to the calico printers, who now onwards get mostly the handloom products for printing. The severe set back will easily be brought home when it is realised that out of 2400 'Chhippas' (calico-printers) at Ahmedabad only 600 get employment in printing today, while, other centres like Mahudha, Kathlal, Kapadvanj, Modasa, Rajpipla, Umreth, Gandevi, Kathor, Vijapur and Padra (Baroda), etc., etc., have gone into oblivion. At present the important centres of Gujarat which are able to hold their own are as under:—

	Calico Printers	Bales (white) and coloured) they print	Estimate of value of their printed cloth
Ahmedabad ...	600	3000–4000	Rs. 4 lakhs
Vadnagar ...	300–400	1500–2000	Rs. 2 to 3 lakhs
Vasna (near Sadra) ...	250	800	Rs. 1 lakh
Rajpur (Palanpur State) .	200	600–700	Rs. 75 to 80,000
Kheda ...	150	7500 (Kodis)	Rs. 1,50,000
Palanpur ...	25 houses	200–250	— — —

Mostly in these centres there are small 'karkhanas' at the houses of the Bhavsars and the Chhippas; and at every 'karkhana' 15 to 20 persons are found working. All the family members help in one process or the other. The coloured cloth is mostly sold to the local dealers who sell them in Dakor, Broach, Godhra, Balasinor, Thasra, Navsari, Surat and such other distant markets.

6 to 8 persons can colour 'one kodi kapad' which means 125 'takas' of 4¼ yds x 48" costing about Rs. 750.

In addition they have to purchase Rs. 50 worth colours and allied materials; while about Rs. 200/- they have to distribute amongst the workers who help them in various processes*. Cost of fuel and sundries comes up to Rs. 50/-, hence the cost of printed cloth comes up to Rs. 1050, while the sales returns will be Rs. 1200 (50 kodi x 24 to 25 Rs. per kodi = Rs. 1200). Hence with six people at work from the house, the head 'Chhippa' gets Rs. 150 to 200 as the joint remuneration. Mostly these people colour 'Chhidra's' (special pattern cotton saris), 'Kholiyas' (bed covers), and prepare Red 'Gavan' and 'Kathai Gavan' or Red and 'Kathai' piece-cloth. These calico-printers thus get the work which is still not executed in the textile mills. Moreover, to improve or print designs on few saris and then to change the dies, etc., is not convenient for the textile mills. Hence to a certain extent this industry is bound to persist on hand-basis.

KNOT DYEING OR BANDHANI

The required cloth is first of all stamped with straight lines or curves and on all these lines are made designs with dots. Thus the process is a very elaborate one. The workmen hold the thin bit of cloth with their forefinger and thumb nails. They tie the knots on the cloth with the right hand, while the cloth is held by the left hand. After this is done, the cloth is given to the dyer, who, commences the work by immersing the folded up and compactly tied cloth in the lightest shade that is intended to be given. Then, it is handed to the 'Bandhani' worker, who works

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* For printing 6 workers to be paid 16 Rs. per month ...	Rs. 96-0-0
3 Khāriyās to apply oil Rs. 10 each	Rs. 30-0.0
3 Dhobis (washermen) in all to be paid	Rs. 40-0-0
3 'Āliyā Fāliyā' (two to twist the wet cloths to take out the water, and one to dry them by fixing them on suitable spots)	Rs, 30-0-0
	Rs. 196-0-0
	i.e. about Rs. 200-0-0

on it a second pattern by tying up another series of raised up points. It is again dyed in the next shade and if the pattern is thus completed, the threads are loosened and the cloth is opened revealing a field of one colour with a pattern in points of two other colours repeated all over. If more elaborate designs are required, the tying and dyeing is multiplied. These 'Bandhanis' are very beautiful and artistic but costly when compared to the spray work products of textile mills.

Knot printing still persists to a certain extent at Ahmedabad, Surat, Patan, Cambay, Palanpur and Baroda. But, in all, the number of Knot printers in Gujarat is hardly 100*.

However, the industry is on its waning side. With the spray work's introduction in the textile mills (and the production of Dariai moj and 'vadali' patterns), Knot dyeing has received a crushing blow. The mill's attractive and cheap production has outwitted its importance ; and with the passage of time this industry is likely to be extinct.

In the end, we would like to refer to the 'Abhrak' work of Patan and Rajpur. To rough khaddar pieces they die specially and then with the help of 'Abhrak' (mica), 'Sindur' (leadoxide) and 'Safedo' (zincoxide) make designs on the cloth by a thick needle ('suyo'). 'Ful' (flower) 'dānā' (dots), 'zād' (tree), are usually painted by the above material hence the cloth piece becomes very attractive. It is used for table cloth and window curtains by the educated people, while the females of the untouchables use it as the petticoat cloth (as 'ghaghrapat').. Only 4 Brahmkshatris at Lakhiyar Vada Patan and two at Rajpur are engaged in this work. These printers also require castor oil ('divel') and Red, Yellow and Green colours.

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* Once this number was running in thousands as will be easily realised from the Report on Art-Crafts of the Bombay Presidency by Mr. G. P. Fernandes, "Knot dyeing...is extensively practised in Ahmedabad. Over 10,000 women are doing this work here in 1937..." *vide* page 11.

One 'pat' (= piece of cloth) of 8 gaj × 1¼ gaj costs Rs. 4–4–0, and with Re. 0–12–0 worth printing material (colours, etc.), within two days its dyeing and printing can be completed provided 10 hours labour per day is put in. This 'pat' is then ready for sale with mica coloured 'dānā' ('dot') design on it and it fetches Rs. 6/– in the market. The artisan, therefore, hardly earns 8 annas per day. For the last decade or two the females of the untouchables have begun to favour coloured piece goods of mills ('lal', 'lili', 'Chhint'). Hence the demand for this 'needlework' (suya kam) has fallen. Unless the new designs are shown to these artisans, and, their production is popularised in time, this art is likely to die out from Gujarat.

MUD PRINTING

Mud Printing persists on a very small scale at Rajpur in Gujarat. Only two artisans print saris and 'Marwari Chhint'. They earn hardly six annas per day while at Patan this work is on the verge of extinction.

First of all the coarse white cloth is washed to remave the starch. Then it is dyed with tamarind seed ('kachuka') to make it pinkish. Then red spots are printed on the cloth and again the cloth is washed. The white mud spots are applied on it and it is dried. After so many processes it is coloured into black. Backward communities used to patronise this cloth in the past. But now its demand is fast declining.

There is a general complaint that dull colours are used in Gujarat when compared to Sind. If specimens of cloth to suit European tastes with bright lemon, yellow, brick red or green colours can be made, more market can be created for these goods.

SIZERS OR 'KĀNJI PĀNĀRĀ'

There were about 30 families of sizers at Ahmedabad actively engaged in applying sizing materials to the ready made handloom cloth. With the introduction of textile mills and with their sizing plants at Ahmedabad, their services were no longer required.

We find today only 2 families engaged in this work at Ahmedabad. Their equipment is simple 'Sikara', 'Khapat', 'Jog', 'Ghodia', 'Ghunchdo' (Brush), etc. cost hardly Rs. 60/- As for raw materials they need 'kodri' (rice) and wood (for fuel). From Kodri they prepare 'kanji' (that is sizing material) and get 0-10-0 per 'tani' of 36 yds, which means they get annas 10 for applying sizing material* to cloth of 36 yds in length. In preparing sizing material and in applying it to a hanging cloth, 7 or 8 family members help; and with great difficulty by working for long hours they can complete two tanis per day which brings them Re. 1-4-0. Their yearly expenditure (for wood Rs. 15/-, for 'akhādā' (implements) Rs. 3/- and for the kodri (rice Rs. 54/-,) is Rs. 72/-. Hence from their remuneration of Rs. 450 if the above amount is deducted their net family income comes to Rs. 378 per year. Hence this occupation leaves Rs. 30/- per month to a family of 7 to 8 members!

Their income was more than Rs. 50/- per month about a decade ago, while it was Rs. 80 to 90 in the hey day of the handlooms. Mr. Haffisbhai Habibbhai who was interviewed by us at Ahmedabad informed us that as he and his brother were aged their two families are still sticking up to this industry. They do not get enough work, to keep them employed throughout the year. Practically at all the handloom centres in Gujarat, at present the handloom weavers themselves are applying the sizing material to their cloth because they do not get enough weaving work. Hence the sizers have practically ceased to exist as a separate class in Gujarat.

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*They require 50 'khapats' of Re. 0-6-0 each; 7 'ghodias' Rs. 12 worth; 12 'ghunchda' (brushes) Rs. 2-0-0 each; 2 lbs sizing material for 36 yards cloth piece.

GOLD THREAD INDUSTRY

Raw Materials: Surat is the only centre for this industry in Gujarat*. The raw materials required by this industry are cotton yarn (mercerised or otherwise of very fine count), silk yarn, gold and silver. Of the cotton and silk yarns required to make " Kasab ", silk is the important material because it is very fine and smooth (polished) and hence it serves the purposes of this industry in a better way.

Silk: A good part of the silk yarn is imported from France, Switzerland and Germany.† France sends silk yarn to Surat of about Rs. 2 to 3 lakhs per year. Merchants of Surat also import silk from Kashmir in hanks and get it dyed at Surat. Chinese as well as Japanese silk yarn is also imported but it is not used in the manufacture of gold thread as the yarn is not suitable for weaving fine count gold thread of 2000 yards or more from one ounce weight of Silver. Hence Chinese and Japanese yarn imports are chiefly meant for the manufacture of silk cloth and silk brocade (known at Surat as 'Reshmi Tanchhoi').

Silver: Another more important and more valuable raw material for manufacturing "Jari" and "Kasab" is silver. Surat people purchase silver from the Bombay market. The local estimate of consumption of this material by this industry is of average 10 bars, i.e. 30,000 tolas of silver per day, amounting to 9 lakhs of tolas per month.

The Surat manufacturers use Surat made silver wire only if they have to make thin wire to the extent of 1,200 yards from one ounce weight of silver. If thread finer than this weighing 1600 to 3000 yards from an ounce weight of silver is required, it is usually made from silver wire imported from Benares. Benares wire is stated universally to be of the finest quality and it gives a very fine quality thread. The practice, therefore, is to send silver ingots from Bombay or Surat to Benares and pay for the manufacture at some fixed rate. An allowance of about one per cent is given to Benares contractors for loss of weight during the manufacture.

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*Except Benares and Bombay, which are still holding their own, all centres like Poona, Yeola, Ahmedabad, etc., have by now faded into insignificance. We shall not be far from truth in our estimate if we say that more than 60 per cent of the total output of real gold thread of India even today stands to the credit of Surat. Delhi and other centres have recently come into prominence but they are noted for artificial or imitation gold thread.

†Because of the present war these imports have practically ceased.

MAIN PRODUCTS

For our purposes we divide this industry into two broad divisions:

(*A*) *Kasab:* First is the "Kasab" or "Thread" industry. Wherever, therefore, we come across the word 'thread' it is implied that thin (real half-fine or imitation metal) wire is wrapped over the silk (or cotton) yarn.*

Real or Pure Kasab (Kasab made of silver or gold gilded silver, therefore, known as "Sacho" Kasab, "Ruperi" or "Soneri" Kasab as the case might be), is made of precious metal.†

At present at Surat pure Kasab is manufactured, and, with this real Kasab, France's recent invention of above half-fine Kasab severely competes in price and finish as Lyon workers are successful in gilding copper wire and making thread out of it—yellow or white as desired—which never turns black. Half-fine thread ('Kasab') works as a cheap substitute to real Kasab of Surat. Surat people do not know how to manufacture this half-fine thread and hence they are not able to compete in the same product. Half-fine thread is 2½–3 times cheaper than real thread, and therefore, can tempt easily the consumers to purchase it.

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*As compared to the requirement of silver, the quantity of gold required in manufacturing gold thread (Soneri Kasab) or gold wire (Soneri Jari) is negligible. It is reported that for making 'Soneri' Kasab 100 ounces of silver hardly require 3/4th rupee weight of gold. Even the Tariff Board Committee, therefore, alludes to gold thread as 'so called gold thread made of silver'. Refer the Report, page 2.

†Other varieties of 'Kasab' are the following:—

Imitation Kasab ('Khoto' Kasab, 'Soneri' as well as 'Ruperi') is made of base metal and turns black with the passage of time. It is very inferior in quality and in no way acts as a substitute to pure Kasab.

Half-fine (*semi-fine*) *thread or Kasab* ('Ruperi' as well as 'Soneri') is made of silver plated copper. It is, therefore, very cheap when compared to pure Kasab and it never turns black.

Various uses of Kasab: Kasab bobbins are freely used in 'Kinkhab' weaving (in 'brocade work'), by this we mean, in making the gold thread attire. They are also used in making various Sari borders, embroidered laces, as well as, in making embroidered pieces for bodice, caps, etc.

(*B*) *Jari:* Jari is the spiral of very thin flattened or round silver wire or gold gilded silver wire.

(*i*) *Real 'Jari' Spirals* (*Spirals of very thin flattened or round wire*)—Real 'Jari' Spirals fetch more value than real 'Kasab' because 'Kasab' as already mentioned contains cotton or silk yarn. These jari spirals (according to their varieties as they are either flat or round and also according to their thinness, etc.) are differently termed as Sadi, Salma, Kangri, Chalak (Zic), Gokharu, etc. (*Sadi* is a spiral of flattened wire on a round needle and has a circular section. *Salma* is another form of spiral on a round needle and is made with round wire, thus differing from the rest of the class. *Kangri* is made with half flattened concave wire on a round needle and has a circular section like Sadi. *Chalak* is a spiral of flattened wire round a square needle and has a square section. *Gokharu* is a twisted spiral of flattened wire.)

(*ii*) *Real Jari Wires or Lametta.*—While garlanding our friends on propitious occasions we find that the garland as well as the flower bouquet contain thin shining wires. Mostly these garland-preparers use imitation wire. But then such real, imitation or half-fine thin flattened wires are required in embroidery weaving also. According to their thinness they are termed Tasa, Mukhas, Badlo, etc., these wires are used in making pure 'Jari' attire. In England, they include these thin wire products under the head 'Lametta'. Thus we get in the market Tasa, Mukhas, Badlo, etc., made of real, imitation or half-fine wire. These 'Lametta' products are also used in making knitted laces or sari borders. These borders are termed as Badla, Lappa, Tasa according to the type of flattened wire used in making them.

(*iii*) *Tiki-Katora, etc.*—Tiki is a very tiny circular disc with a small hole in the middle and is largely used in embroideries. Katora is made from flattened wire with the assistance of special dies.

In 'Jari' products, therefore, we have grouped all sorts of spirals. In connection with these spirals it should be noted that out of half-fine wire it is still found very difficult to make such spirals, as at high speed the copper wire breaks and, therefore, no competition exists to real 'jari' spirals from this direction. Tiki, Katora, etc., are also not still successfully made from half-fine metal. At least no competition is felt by our manufacturers in these products. Only therefore, in Lametta products (that is in various types of thin flattened wires like Tasa, Badlo, Mukhas, etc.) the competition from half-fine metal wire is existing.

THE TECHNIQUE

'Pavthawallas' and their old technique: According to the old practice silver was first melted and wire of 10 to 12 feet in length from one tola weight of the metal was drawn. Wire thus obtained was then arranged in hanks (Gunchali). The labourers used to draw the wire of necessary length with the help of 'jantar' or wooden roll (Pāvthā) turned by hands and legs.

Few years ago wire drawing was carried on in about a hundred houses and about a thousand workers were employed in the wire drawing activities. But after the introduction of machinery run with the electric motive power practically all the 'Pāvthāwāllās' (Pavtha Owners) have been rendered unemployed.

'Tanias' (Old Process): When the wires of 10 to 12 feet length from one tola weight of silver were made by the 'Pāvthāvāllās', the merchants used to send them to 'tānias' to draw thinner wires from them. There were about 250 workshops for this type of work at Surat. They made thinner wires by the help of 'jantars'. About 3,000 workers used to get employment in this industry.

"Wire Drawing Machines" (New Process): But after the introduction of wire drawing machines (Tār-Tānvānā Sānchā) which are now run by electric motive power, only 300 to 400 workers are required for the same output.

"Chapadia" Flattening of Wires (Old Technique): The old method of flattening wire consisted of taking a number of wires on a polished anvil and striking them with a polished hammer. It is still continued in flattening of coarse wires—that is, in making 'Mukhas' (one of the jari products grouped under 'Lametta').

**Rolling (or Flattening) Mills (New Technique)*: But this practice has largely been displaced by the introduction of delicate rolling mills (Chapadvānā Sānchā) with well polished small rolls revolving at a very high speed. In the beginning of the introduction of these rolling mills it was discovered that in the process the wire was pressed so much that it not only flattened but it was also elongated, and hence, weakened. To obviate this defect, a variant of the rolling mill is now in use in which rolls move at a lower speed and flattened wire is collected on reels instead of being dropped in heaps. This has,

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* It is reported that one 'Chapadia' was able to meet the requirements (of flattened wire) of four spinning machines. But now the rolling mills have practically dispensed with his services.

therefore, resulted in quicker and better output and cheaper cost. European machines, which are imported for this purpose, possess automatic arrangement. They stop when the wire breaks and they are so devised as to take measured quantity of wire on spools. Rolls which flatten the wires are an important part of the machinery in a flattening mill. They have to be hardened very uniformly and require the use of special steel and also the special process of hardening. Even in Europe hardly 2 rolls, out of every 10 manufactured, turn out entirely satisfactorily. Whereas in India it is very difficult to get satisfactory rolls. The Indian rolls are either too much or too little hardened. In the first case, they lose grains of metal and get covered with pits which hold up wire and break it. In the other case, they are cut by wire, and these canals scrap wire or hold it up and break it. Government workshops should, therefore, undertake the experiments, so that a right sort of rolls may be manufactured locally at Surat for flattening the wires.

Spooling Machines (*Tar Bharvana Sancha*): Wire has got to be transferred from time to time from one bobbin to another and has also to be put on special bobbins for the market. This was done formerly by handwinders. Even now, if it is to be done on a small scale, handwinding is resorted to. But for large quantities spooling machines are now introduced.

Polishing of Rolls: The finish of flattened wire depends upon the polish of flattening rolls, which have, therefore, to be always kept well polished.

Hand polishing was possible in the case of small rolls in past, or in the case of a pair or two of big ones. But a machine is now necessary for this process as a number of large rolls are in daily use.

Spinning Machines (*or Vintalvana Sancha—Often Called "Tar Kas Na Sancha"*): In making 'kasab', flattened wire collected on small spools, is spun round cotton or silk yarn.

This machinery for spinning the thread is being constantly improved in the Western countries, especially at Lyon, with a view to get better finish at cheaper cost. While there are still some places in India where wire is spun manually round the yarn. But the spinning machines have practically displaced the spinning by hand at Surat. Some of the machines are taking 60 threads at a time in Europe, and the latest type that was contemplated was to have each thread connected with an electric bell and light which will draw the attention of the operator as soon as it breaks*. It is, therefore, necesssary to go on constantly improving the 'kasab' spinning machinery at Surat and to keep into touch with the changes in the technique at Lyon and other places in order to be able to successfully withstand their competition in the world markets.

Most of these Spinning Machines 'Tārkas nā Sānchā', are manufactured at Surat. Their prices vary from Rs. 200 to Rs. 400, and usually the workers themselves are the owners of these machines.

Gilding Processes : Another important change introduced at Surat is in the method of gilding the silver wire. In order to manufacture 'Soneri Kasab' or gold thread (really it being gold gilded silver thread) hot plating process is in existence here from early times.

First a real gold leaf is wrapped and pressed round a bar of silver which is then heated almost to melting point. The leaf of plate is again pressed on the red hot metal and is then allowed to cool. The plated rod is then drawn into the required degree of fine wire. The quantity and in particular the durability of the wire manufactured in this manner depends, however, upon the skill of the workman in pressing the gold leaf on the silver bar. The above pro-

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*** For further details *vide* The Gold Thread Industry of Surat by the same Author from the Journal of the University of Bombay, Vol. IX, Part I, July, 1940 issue, pages 184–210.**

cess is now replaced by the process known as electroplating. In this process ready made silver thread (Kasab) is gilded by passing it through electroplating baths; uniformity of deposit and tone is, therefore, mainly secured by proper attention to the speed of the thread, the temperature, concentration of the baths and the strength of the electric current.

Thus when the above hot plating process constitutes the first stage in the manufacture of gold thread (as the very red is plated and then the Kasab is made), the electroplating process (more modern method) is the last of the operations undertaken (as the ready-made silver kasab is gilded by this process). Commercially, however, the distinction between these two methods consists in the percentage of gold used in the manufacture. Since in the hot plating process at the commencement of operations gold leaf is wrapped completely round the silver bar, it follows that gold wire when flattened is gilded on both sides. On the other hand, it is the ready-made silver 'kasab' which is gilded in the final stage by electroplating process, and hence, it is gilded on the outside only. Consequently hot plating process requires twice the amount of gold to be used as compared with the electroplating method. Further the cost of labour in wire drawing is greater in the case of hot plated gold thread, because manual labour has to be used throughout, as no satisfactory drawing machine is yet invented which will not damage the plate. But the durability of hot plated thread is greater, and, owing to the additional quantity of the more precious metal used, its secondhand value is also higher. We can, therefore, safely conclude that hot plated gold thread serves a special market, and that competition of the imported article is mainly with Indian electroplated gold thread.

CAPITAL INVESTED

Capital invested in the Machinery: It is very difficult to give the exact figure of the capital invested in the machinery in this industry at Surat. However, from local inquiries it is possible for us to form some approximate idea. We, therefore, give below the approximate idea about the capital invested in them. It should be remembered that exact calculations have not at all been made. Therefore, the figures give only the rough idea as to the number of factories or looms and capital invested therein.

Particulars	*Capital invested* (Rupees)
6. Large wire drawing factories having complete wire drawing machinery for a maximum output of 10,000 tolas of silver wire per day. These factories manufacture wire to the fitness of 10 gaj or 20 ft. to the tola from silver ingots supplied ...	3,60,000
12 to 15 factories manufacturing wire from 10 gaj or 20 ft. per tola to 1,200 ft. per tola	24,000
Rolling Mills (Wire flattening machines or ‘ Chapadvānā Sānchā) For three spinning machines generally they keep one pair of rolling mills. These mills are mostly owned by spinning factory owners (or by ‘ Tār Kas nā Sānchāwāllās ’). One pair costs Rs. 150 to Rs. 250. In all about 400 pairs are estimated to be at Surat	80,000
500—600 Spinning Factories, spinning gold or silver thread, containing in all about 1,200 Spinning Machines	3,60,000
3,000—3,500 Looms of various types for preparing embroidery laces including the under-pick looms (about 120) for making embroidery trimmings and gota looms (about 200) for manufacturing plain gold thread flat braids	50,000
About 20 braiding machines...	2,500
About 100 small gold gilding factories for gilding silver thread	30,000

We might, from the above facts, safely conclude that about Rs. 6 lakhs to Rs. 7 lakhs have been invested in the machinery in this industry at Surat. However, we have to remember that impliments or tools like hammers and anvils, etc., required for making Tiki, Katora, etc., are not included in the above calculations. By this we mean that as the equipments and the instruments necessary for all the products which are still worked on the handicraft basis at Surat could not be taken into account, our above estimate is the most conservative one. As regards the capital invested in the industry itself, we have been given to understand (and our investigations also do support us) that the total output of this industry at Surat stands at about Rs. 80,00,000* and that, this industry employs today about 12,000 to 13,000 workers‡.

The windfall in the employment can be attributed to the introduction of machinery in the various stages of this

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*If analysed futrther the estimate of the merchants about the 'jari' as well as 'kasab' output of Surat is as follows :—

			Rs,
A,	Real Kasab (gold as well as silver thread)		45,00,000
B.	Jari : (*a*) Spirals...Chalak	5,00,000	
	(*b*) Lametta...Salma, Sadi, Kangri as well as Tasa Lachha, etc. taken together	10,00,000	15,00,000
C.	Tiki, Katora, etc.	...	20,00,000
		Total	80,00,000

We are also given to understand that Surat's annual output of imitation kasab is about Rs. 5 to 7 lakhs and of imitation 'tiki' (jari) of about Rs. 10 lakhs.

‡ According to Mr. G. P. Fernandes, 19,000—20,000 workers were employed in this industry by about 1927 and Surats annual production was about Rs, 1,00,00,000.—*Vide* his Report on Art-Crafts of the Bombay Presidency, pages, 22-23.

industry. However, the output does not show great decline which it ought to, especially in the period after 1929–30 which is classed as the period of World Depression. Times of depression are likely to affect luxury crafts most, and even though a decline of about Rs. 20 to 30 lakhs in output is a substantial one, it is not so marked when viewed from the point of view of severity with which this economic crisis affected India. One might, therefore, be easily led to inquire whether any new markets were created during these adverse years of depression. And this is what has actually happened in case of this industry. Gold thread industry (Protection) Act, 1931, gave further protection to this industry. It levied a desired check upon the foreign imports which consequently showed a heavy windfall from 1931–32 onwards. But the imports have not completely ceased. We shall further discuss this point while studying the present conditions of this industry *vis-a-vis* the Tariff Board Inquiry's recommendations and the foreign imports after 1930–31. Sufficient it is for us to note these points and move further to study the conditions of the labourers in this industry.

PRESENT CONDITIONS OF THE LABOURERS IN THIS INDUSTRY

As already seen, this industry employs in all about 12,000 to 13,000 people. Even the Tariff Board Committee came to the conclusion that as the demand for gold thread depended very much on general prosperity, and to some extent as it was seasonal (market improving with the marriage season), the outturn during the course of the year varied considerably. It being so, any estimate based upon the number and capacity of factories, in their opinion, was bound to be misleading. They, therefore, based their conclusions upon local inquiry.

In this connection, therefore, when we interviewed Sjt. Harkisondasbhai of G. D. Tarkas firm (who is a dealer as well as a manufacturer in this industry) at Galemandi (Surat), he gave the following approximate estimates :—

Particulars	*Approximate Estimate* (Persons)
In initial stages and Kasab manufacturing :	
Tanias making, Silver wire by ('jantar') (hand-process)	100
In wire drawing	400
In wire flattening	1,000
Gold Thread Machines (Spinning Machines) "Tārkas nā Sānchā"	1,000
Gold gilding factories (about 100) giving employment to about	1,000
In real Jari products :—	
Tiki making	200
Katori making	25
Chalak (Zic) making	350
Tasa (Badla) making	25
Salma and Kangri making	20
In Laces, Borders, etc :—	
Badla (Jari-Lametta) border making	1,300
Kasab border	500
Indori	500
Kasab-Kinari-Laces	1,300
In embroidery weaving	3,500
In Kinkhab weaving (this is chiefly in the hands of the Benarasi weavers at Surat) :—	
(*i*) Main Benarasi Weavers	300
(*ii*) Small boys attending the looms (for warp and weft processes)	500

The above estimate of Sjt. Harkisondasbhai is also confirmed by Sjt. Munchhubhai of Balabhai Nathabhai Jariwalla's firm.*

In Jari Work: (a) Tiki and Katora making:—At Surat in all about 200 to 300 people are engaged in tiki and katora making in about 25 kārkhānās. They receive remuneration on piece rate. 'Each of them can earn rupees 10 per month if he is regular', remarked Mr. Hiralal Dajibhai Brahmin when he was interviewed at his Kārkhānā at Rampura. Mr. Hiralal employs six men on piece rate to make tikis. These people are mostly Dublas coming from the adjoinig villages like Targam, Parvat, etc., They get Rs. 3 to Rs. 4 per 100 tolas of tiki, and from one 'val' (that is 1/32 tola weight of silver) they make 80 tikis. It is reported in this connection that at Calcutta 125 tikis are made from the same quantity. But tikis are exported from this place to Calcutta as labour is cheap at Surat. One Tiki maker can make tikis out of about 15 tolas if he works for 8 to 9 hours per day. In this case, therefore, if throughout the month he gets work a tiki maker can earn Rs. 18 per month. But actually from the accounts shown by our friend it appears that though three of the workers named Chhagan, Khusal and Thakore got Rs. 20-15-0, Rs. 21-6-0 and Rs. 17-15-0 in that particular month of October, on an average these tiki makers earned Rs. 8 to Rs. 10 per month. But these people hardly get work for about eight months in a year. The equipment of the **kārkhāndārs** of these products is simple and not at all costly consisting as it is of dies, anvils, hammers, tongs, etc.

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*I was very lucky in obtaining the co-operation of these two enlightened dealers as well as employers of Surat. For this I am much indebted to Sjt. Kaniyalalbhai Desai, President of the Surat District Congress Committee, who facilitated my work a great deal by kindly putting me into touch with them. Sjt. Manchhubhai, the Vice President of the Gold Thread Association, Surat, is also one of the chief exporters in this line. He also helped the Tariff Board Committee in their work when they visited Surat. I, therefore, could obtain very valuable information from him with little difficulty. While in spite of his ill-health, Sjt. Harkisondasbhai accompanied me from place to place day and night in order that I can get first-hand information from the artisans themselves by personal inquiry.

(*b*) *Spirals making*.—Chalak, Salma, Sadi, Kangri, etc.

(*c*) *Lametta products*.—Tasa, Mukhas, etc.

About 50 Chalak making concerns are there today at Surat, whereas a few years back there were about 160 concerns. As the wearing of gold thread embroidered caps and cloth is now out of fashion their number has gone down considerably. The same is the case with the 'Sadi', 'Salma' and 'Kangri' making concerns. There are 3 or 4 Kangri making concerns employing about 15 workers, and half a dozen Sadi and Salma making concerns in all employing about 50 makers.

Workers are mostly Golas and Dublas and they are addicted to drinks. They earn per day on weight—each of them earns per head average Rs. 7 to 8 per month. Their condition is very poor and according to their necessity they borrow from their Karkhandars Rs. 40 to 50 or even Rs. 100 in advance. The raw materials of the industry are silver wire, white zinc, glycerine, etc. The production is for orders. The karkhandars are afraid of producing for stock as Chalak lose lustre if stocked for a few months. Their equipment is mostly ½ H. P. Rolling Machine for pressing the wire and locally made Chalak (Salma, etc.) manufacturing machine. The total equipment with them is hardly worth Rs. 400.

EMBROIDERY WEAVING AND LACE MAKING

Lace Making: Lace trade is carried on by different communities. But its weaving is solely in the hands of Khatri community at Surat. These Khatris decline to teach their art of weaving laces to others and they have been able to preserve their trade secret (like the 'Sujjani' preparers of Broach) by their organisation and caste rules. They take pride in pointing out that 'Indori' borders of artistic designs, various types of 'kasab' laces, and, Zic (or Jari) laces made by them have no equal in the world (that is, they stand second to none in the world).

Laces are generally classified as (*i*) embroidered, (*ii*) knitted, (*iii*) braided and (*iv*) woven. Various embroidered laces are made from Jari (Lametta). If they are made from Chalak they are known as 'Karchobi', if from Salma then 'Zardosi' and from Kangri as 'Kamdani'. In India these embroidered laces are mostly hand-made as the materials are too fragile to be worked on machinery and the designs too many to permit production on a large scale.

In case of Europe, on the other hand, this is a home industry taken up especially by female workers. Their designs are bolder, more fresh and artistic. Hence the improvement of Indian article upto the standard of the European make is a necessity, if we want to develop foreign markets (which we have none today) for our embroidered laces. Moreover in Europe the manufacture of embroidered laces is carried on on a fairly large scale, and therefore, in their manufacture machinery is also used.

Knitted Laces: Knitting machines are used in knitting these laces; hence they are known as knitted leces. But the laces manufactured in the largest quantity at Surat are the 'Woven laces'. These woven laces have various trade names after their designs. They are known as 'Gota', 'Dhamuk', 'Anchal', 'Kinari', 'Badla', etc., and they also include among them certain types of tapes. These laces are woven on looms constructed almost on the same principles as ordinary looms, with the exception that the weaving breadth is very small varying from ½" to 3".

Kinkhab weaving or Brocade Work: Kinkhab Weaving (at times known as Metal Cloth Weaving, or gold attire making) is the highest product of this industry. Surat had earned world wide reputation for this industry in the past. There is still good home trade in kinkhab, but the foreign demand has almost disappeared. Moreovere, the home demand is also decreasing with the change in taste by the passage of time.

Rao Bahadur Shastri has mentioned in his report on the Gold Thread Industry that metal cloth known as 'Tasa' cloth (Jari cloth) in the manufacture of which flattened wire (jari-lametta) takes the place of 'kasab', is manufactured on powerlooms in Europe. If, therfore, we want to cater foreign markets, we shall have to introduce these looms at Surat.

It is, however, necessary to note that these embroidery weavers (about 3,500) as well as the laces and the border makers (about 3,600) hardly get minimum subsistence from their occupation. By working for 8 to 9 hours they earn about 3 annas to 4 annas a day, and that more than half the number of embroidery weavers come to Surat from the adjoining villages, work at Surat throughout the day and return to their villages in the evening. In the rainy season most of them occupy themselves in agriculture. Those who thus come from the mofussil are 'kanbis' or 'dublās' while most of the local embroidery weavers and lace makers are khatris and golas. These people are illiterate, they have no organisation of their own and mostly they get remuneration on piece rate. As numbers of hands began to be thrown out of employment, with the introduction of the machinery, cut throat competition ensued among them to obtain the work and they began to accept lower and lower remuneration. In order to safeguard their interests there is, therefore, a necessity of forming their Association.

The highly paid workers in this industry are Kinkhab weavers. The expert weaver (in all about 300 at Surat) gets about Rs. 13 to Rs. 15 per month, but he too does not get employment throughout the year. For about two or three months in a year he remains without work, He gets remuneration on piece rate. On the other hand small boys required to attend the warp and weft processes (for 'Vāno' and 'Tāno' that is 'Kāntho Khādhavā Ane Dor Khenchvā': about 900 boys working at Surat*) obtain 2 annas to 3 annas per day. Some check on the employment of young boys is a necessity, even though to poor families, their young ones thus augmenting their family income are a blessing. In getting employed at a very early age, their whole life is practically ruined. They remain uneducated and hence fatalist in their attitude and often get addicted to smoking, drinking and other vices which prove to them a source of relief from their day's hard toil. The very idea of employing young boys of 6 to 10 years will be very shocking to the people of the Western countries.

Above facts bring home to us that as the products are mostly made on the cottage basis, most of those engaged in this industry are labourers, and, only a couple of hundreds are kārkhāndārs, and that ultimately all the manufacturers pass to the traders who are the exporters of 'kasab', 'jari', and all embroidered pieces and cloth. There are about 500 merchants in all (if big and small are included) at Surat, and they are the only people in the know of the markets.

However, when most of the technique requires to be improved it is neither possible nor convenient at the present juncture to suggest the ways and means to amileorate the conditions of the workers in this industry. Labour is one of the chief factors entering the cost and as far as possible we have, under the existing conditions, to pay attention to the interests of the industry as a whole.

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* At Surat today about 500 boys are helping in warp and weft processes in weaving, while about 400 boys are engaged in inserting thread in the spirals like Chalak, Salma, etc. (in "Dora Parovavā") so that these spirals might not lose their shape or lustre.

As given out by Sjt. Harkisondasbhai as well as Sjt. Manchhubhai, prior to 1925 about Rs. 1 to 2 lakhs worth embroidery articles were exported to Madagaskar. But by about this time the French Government levied differential tariff upon them and hence the exports to Madagaskar are now practically nil. They further informed that 'kinkhab' manufacturers had a large market in Burma. But after the last World War kinkhab weaving was introduced and encouraged in Burma with the consequent result that today the Burma market is practically lost to Surat.

Leaving aside, therefore, the actual conditions of the workers in this industry, we would like to consider the position of this industry *vis-a-vis* the Tariff Board's recommendations and the foreign imports.

CONDITIONS OF THE GOLD THREAD INDUSTRY AT SURAT FROM 1930-31 TO 1937-38, VIS-A-VIS THE FOREIGN IMPORTS.

It will not be out of place here to recall that the appointment of the Tariff Board Inquiry Committee was mainly due to the keen interest evinced in this industry by Sir Purshottamdas Thakurdas, KT. C. I. E., M. B. E. Between 1924 and 1930 when he was a member of the Legislative Assembly, he carried on agitation in and out of the House to create public opinion and impress the Government of the need for granting protection to this industry. Ultimately this veteran economist and industrialist succeeded in getting appointed the Committee to inquire into the conditions of this industry. The Tariff Board Committee were satisfied as to the three conditions laid down by Fiscal Commission:—(*i*) The industry must be one possessing natural advantages. (*ii*) The industry must be one which without the help of protection either is not likely to develop at all or is not likely to develop so rapidly as is desirable in the interests of the country. (*iii*) The industry must be one which will eventually be able to face world competition without protection.

They, therefore, recommended that 50 per cent *ad-valorem* duty should be levied upon real gold thread, lametta, manufactures from silver wire such as spirals, spangles, etc., and all colourable imitations. They also recommended this protective duty for a period of ten years during which they hoped the Indian industry to reach the European Standard of quality. As a result of their recommendations Gold Thread Industry (Protection) Act, 1931, was passed by the Government of India and protection to this industry was given for a period of 10 years. 50 per cent *ad-valorem* duty was given levied on "Silver thread and wire (including so-called gold thread and wire mainly made of silver) and silver leaf, including also imitation gold and silver thread and wire, lametta and metallic spangles and articles of a like nature of whatever metal made."

As a result of this protective duty the imports of Gold and Silver thread decreased from Rs. 20,38,129 in 1930–31 to Rs. 6,55,656 in 1931–32, whereas the imports of lametta had fallen from Rs. 6,26,550 in 1930–31 to Rs. 4,60,420 in 1931–32.* We thus find that the protection has an exemplary effect upon the imports. However, the import figures

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* Gold and Silver Thread Imports in India[1]		Lametta Imports in India	
Year	Value (in thousands of rupees)	Quantity (in thousands of lbs.)	Value (in thousands of rupees)
1930–31	20,38	4,64	6,26
1931–32	6,55	3,67	4,60
1932–33	9,97	4,47	6,10
1933–34	6,45	3,54	4,19
1934–35	4,65	2,67	3,05
1935–36	5,14	4,97	4,25
1936–37	3,71	3,18	3,01
1937–38	4,20	2,42	2,48

[1] Inclusive of Imports by postal packets referred to Collectors of Customs for assessment.

of 1937-38 do show that gold and silver thread of Rs. 4,20,851 value and lametta of Rs. 2,48,593 worth were imported. As the smuggling carried on from the Pondicherry front is effectively controlled, we have only to mark the tendencies of the above imports. We can easily infer that whatever imports are now existing they are of half-fine wire and thread.

Moreover, as suggested by the Tariff Board, and as laid down by the Gold Thread Industry (Protection) Act, the protection was to last for a period of only ten years. That means by 31st March 1941 the protection was to be removed‡. Will, therfore, the industry be able to stand on its own legs when the protection is removed ?

From our analysis we have seen that as a whole in this industry there are about 11,000 labourers. That there are about 1,000 karkhandars employing these labourers under their shades and allowing them to use the simple tools of their karkhanas to work the raw materials mostly provided by the merchants. These petty contractors hardly earn remuneration of Rs. 80 or Rs. 100 on an average per month for about 7 to 8 months in a year. The petty contractors who employ the labourers at their karkhanas to work crude spinning wheels, to make jari products (spirals) like kangri, salma, sadi, or chalak get Rs. 2-8-0 or Rs. 3 to Rs. 6 per 100 tolas. Similar is the condition of the owners of tiki or katora making concerns which we have already studied. Leaving aside these people there remain a few hundred factories, e.g., gold gilding, wire drawing, etc. Herein also spinning of silver thread is at times done in the merchants' premises; or usually the work is given to these contractors who are paid about Rs. 25 per 100 tolas of thread which usually measures 2,000 yards per ounce. At the top of this industry are about 500 merchants who are dealers and exporters of ready-made products of this industry. Looking, therefore, to the structure of this industry we cannot expect anybody from these petty karkhandars or factory owners to be capable enough and having finances enough to introduce new changes. With their petty resources they will feel shy to venture when so advised. On the other hand, the merchants naturally remain busy with solving the marketing problems of the products throughout the year.

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‡ According to this Act of 1931 the date upto which the Protective Duties were to remain into operation was 31st March 1941. It will be gratifying to note that the Government of India extended protection for one year more on the same basis (that is by imposing 62½ per cent *ad valorem* duties) upto 31st March 1942, and, later on, they have further extended the protection by levying 75 per cent *ad valorem* duties which is to remain in force upto 31st March 1944. It seems, pending the appointment and the inquiry by the Tariff Board Committee, they are adopting these temporary measures.

Realising this, the Tariff Board also recommended that 'at a comparatively small cost a centre could be provided at which improved methods could be demonstrated and instructions given in the use of better machines and processes.'*

But no heed is paid to this suggestion. The Government seem to have been satisfied by giving temporary protection and leaving everything else to be accomplished by the manufacturers in this industry. If no definite attempts are to be contemplated, one naturally wonders why the Government should appoint such Committees which simply prove a burden to the poor tax-payer? Why should Government be interested in placating the public opinion when they have no definite policy to be evolved in the interests of the industry? It is really absurd to find that they create 'war time conditions', that is, give temporary fillip to the industry, and leave it stranded in the end. If the case for an industry is already made out and all the necessary conditions laid down by the Fiscal Commission fulfilled, is it not the boundened duty of the Government to take all the necessary measures to put that industry on a sounder and scientific footing? This is all the more a necessity in the case of especially the Gold Thread Industry of Surat. Wherein simply looking to its structure we realise that even after decades of protection no desired progress will be achieved unless the Government take the active steps to improve the technique. Our recommendations are, therefore, made in full confidence that the Government co-operation will be forth-coming to the extent required.

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* *Vide* page 24, para. 29.

BROCADE WORK OF GUJARAT

For brocade work well known centres of Gujarat are Ahmedabad, Surat, Baroda, Patan, Visnagar, Mugroda, Unza, Upera and Gozaria. But the last five centres have now faded into insignificance. Mostly 'kinkhab' cloth for the 'cholis', 'kanchalis', that is piece-cloth for ladies outwear is made at these centres.* Once Ahmedabad was the leading centre of brocade work in Gujarat. Kinkhab weaving was patronized by the Moghul emperors, and, the officers of the State used to put on costly 'kinkhab' robes while attending the 'Darbar' or the meetings of the King's Parliaments. Their female folk used to put on 'amber', or 'kinkhab' saris. Later on even the Marathas and the Kathiawari Chiefs continued to patronize the production of this embroidered piece-cloth. But by about 1906, there was a change in the fashion, and we find a marked inclination towards simplicity, and the use of plain cloth was gaining ground. Embroidered caps were fast becoming out of vogue, and, the Swadeshi Movement of 1921, practically put a seal over the use of these jari caps.

In Ahmedabad most of the kinkhab weavers were the out workers from early times. They used to get their raw materials (mostly silk and gold thread bobbins) from the dealers and after weaving the cloth, they obtained from the dealers fixed remuneration for their labour. They were paid on piece-rate and they were the workers on contract.

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*Making of 'pitambers' and 'ambars' have been fast given up due to the change in the public taste, and, the trade depression.

Out of about 600 kinkhab out workers as a result of the fall in demand for the kinkhab cloth hardly 100 out workers are found at Ahmedabad to-day.

The orthodox class still favours the use of kinkhab cloth, and, the embroidered piece-cloth, during the auspicious occasions, like marriage festivals. Their children put on Jari caps, gold thread robes or frocks and, their females wear gold thread bodice ('kabja' choli, etc).

Now, there are only two families at Ahmedabad engaged in weaving badalu or tasa cloth (jari cloth) for making gold thread attires for the temple idols (dieties). The demand for such 'vāghā's' jari dress for the dieties has fallen, while out of 700 Modhya looms working in 1917–18 hardly 25* looms are busy making the kinkhab borders (modhyas) for 'cholis' 'kanchalis' and 'kabjas' (ladies' wear).

In Surat, about 15 families (in Golvad) make kinkhab cloth for jackets to suit the taste of the Mohamedans of Iran, Arab and Aden. But this industry has got a severe set back after this War.

The average income from the brocade work is hardly Rs. 15 to 17 per month ; and, as the demand for this piece-cloth is falling due to depression and change in the public taste, it is very difficult to suggest the ways and means to put these patterns on a sounder footing. The only branch of this industry in which there is a good scope is the making of sari borders and laces. We have given further information about this branch of the industry in our note on the scope of the gold thread industry of Surat.

GOLD THREAD INDUSTRY OF AHMEDABAD

Gold Thread industry was once flourishing in Ahmedabad; even as late as 1920 there were 200 'tanias' (wire drawers), 200 'chappadias' (wire flatteners), and, about 200 gold thread machines in Ahmedabad.

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*In 1938 when 'Modhiya Mahajan' took census of 'Modhiya' looms only 69 were found to be working. However, most of them remained idle for more than six months in a year.

But for the last decade or so this industry is practically extinct at this centre. Main cause of the decline is attributed to the competition of Surat. At Ahmedabad this industry existed purely on handicraft basis, while after 1920 Surat manufacturers began to put this industry on machine basis. Even when purely on hand basis labour at Surat was found cheaper than at Ahmedabad; while, because of the use of machinery the following difference in the rate of labour was perceived :—

To Tanias for hand-made wire per tola labour used to cost ...	0–2–0	For Machine made wire per tola labour used to cost	0–0–9
For flattening the wire on handicraft basis per tola labour cost ...	0–1–0	For flattening the wire in machine, per tola labour cost	0–0–4
On handicraft basis to make gold thread (to wind jari spirals round the silk thread) per tola labour cost	0–0–9	On machine for making gold thread per tola labour cost ...	0–0–2½
	0–3–9		0–1–3½

Thus when at Surat up-to-date machinery was introduced, it was no longer possible for the Ahmedabad manufacturers to withstand the competition of the machine made products. Had the machinery been simultaneously introduced at Ahmedabad, perhaps this industry would have still been existing there. But because of the State indifference, and, negligence of the manufacturers to introduce machinery in this industry, gold thread industry has practically died out at Ahmedabad.

OUR RECOMMENDATIONS

It will be easily realised that Gold Thread Industry is one of the art-crafts catering for the needs of the rich class, and the require ments of the middle and the poor classes on some propitious occasions like marriage ceremonies when they feel like spending more after their dresses.

(*a*) As public taste has undergone a vast change on these occasions the use of plain Saris with little embroidery work on them has become the current fashion. Embroidered caps are no longer in vogue and the industry is mostly supported by the people with orthodox taste. To suit the modern taste, changes in the designs of embroidered pieces and borders have got to be made. Expert guidance in this direction (to create live interest for embroidered pieces among the public) is immediately required.

(*b*) Detailed investigations into the absorptive capacity of each market, for every product of this industry, including the considerations of price, quality, design, delivery, etc., should be scientifically carried out.

(*i*) In this connection, therefore, a small Bureau should be established at Surat by the combined efforts of merchants and the Government. This Bureau should be in the charge of a research scholar who can gather statistics, analyse the trend of the markets, and can put up-to-date and valuable information as regards marketing conditions at the disposal of the merchants.

(*ii*) Besides being a research scholar, it would be far more desirable if he is an expert technician having connections with the Department of Industries, Bombay.

In this case, not only he can keep himself well informed with the processes followed in the various products of this industry at other centres, but he can easily persuade the Government technicians about the necessity to carry on experiments for the nature of improvement immediately required in a particular process. Moreover, it would be easy for him to obtain expert advice from Government experts in the proper mixing up of chemicals for dyes, etc., if he himself belongs to the Department of Industries, Bombay.

Being a Government servant, he will be able to keep informed the head of the department of the necessities of this industry and he will also be able to make Government take live interest in the well-being of the workers in this industry.

(*c*) It is reported that French Gold Thread is superior in quality because during 95% of the stages of its manufacture no hand touches the thread, while at Surat this is extensively indulged in with the result that the lustre of the finished product diminishes.

In order to mitigate this defect it will be the duty of this expert to see that as far as possible in all the stages of its manufacture machinery is introduced.

Moreover, in order to assure that no mal-practices continue, he should have wide powers to enforce the rules and regulations framed for this purpose by the Gold Thread Association, Surat. Thus the Gold Thread Association at Surat should not only frame strict rules, but it should also make the above expert responsible for their strict observations.

We are also informed that French superiority in packing, (that is, in making hanks, bundles or packets, and in applying lables), catches the consumers' eyes at once. Hence strict regulations for all such purposes should also be laid down and enforced.

(*d*) Before the Government cease to protect this industry, it will be their duty to see that half-fine thread and wire making is successfully carried out at Surat, otherwise the moment the protection is removed, these imports will definitely hard hit our real thread as well as 'Jari' products like tasa, mukhas, etc.

It will be, however, interesting to note here, that Lyon workers have not succeeded in manufacturing thread (kasab) finer than 2,200 yards per ounce from the semi-fine wire. It is so because the semi-fine wire (mainly as it is of copper) breaks when further attempts are made to add to its fineness.

Hence the process involved in making wire finer than 2,200 yards per ounce is very labourious and costly. It is, therefore, not so paying to spend money after this process. This is why they do not make wire of further fine variety at Lyon.

During the recent years the Department of Industries, Bombay realised the necessity of conducting experiments to manufacture half-fine thread in India.* Because this semi-fine thread of 2,000 yards per ounce is sold at Rs. 8–8–0 per bundle of 21 tolas while similar bundle of Surat's real kasab is sold at Rs. 18 to Rs. 21. Thus the competition in price is severe, and as the semi-fine thread never turns black it acts as a cheap substitute, and so do the semi-fine lametta products like tasa, mukhas, etc. To alleviate this competition there was an urgent necessity of manufacturing semi-fine thread and wire at Surat.

The experiments conducted by Mr. Ketkar proved a huge success and now the Surat manufacturers are able to manufacture half-fine thread of 1600—2000 yards' width from 1 tola copper wire.

But after this war, protection will have to be extended to this industry till the technique of the manufacture of half-fine thread is improved and, the scale of production is extended so that all the advantages of large scale production are assured.

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*Mr. V. V. Ketkar, M.Sc., was appointed as the Chemist for the Imitation Gold Thread Manufacturing Scheme by the Department of Industries.

For, real thread (sācho kasab) Rupee dies ('whay') are used. But for imitation and half-fine thread diamond dies are required and these diamond dies are not made in India. Hence they are to be imported from foreign countries. For the thick variety of 'kasab' (300 to 400 yards per tola variety) brass wires are also used for making half-fine thread. Tiki, chalak, katora, etc. are made from this thick wire. But in making these wires diamond dies are required. Therefore, manufacture of diamond dies should be introduced at Surat.

Moreover, in the manufacture of half-fine thread copper wire is the principal raw material required. We import these copper wires in the ordinary course from the foreign countries like Japan, France and Belgium. Hence as long as the duties on imported copper wire are continued a fairly high protective duty shall have to be imposed on the imports of lametta in India.

By introducing the use of a German dye (colour) 'cori phosphine' as a substitute of gold for gilding purposes, a great economy is made in the production of half-fine thread at Surat.

Silver wire or gilded copper wire is passed through a dish containing the solution of 'cori phosphine', and during the process the colour sticks to the thread and converts it into a 'soneri kasab'. There is, therefore, no necessity afterwards to gild the thread by gold. This substitute has, therefore, resulted in making it possible for the Surat manufacturers to get the half-fine thread at comparatively reduced cost.

We, therefore, hope that the Department of Industries, Bombay, will continue its efforts to improve the technique still further and that it will succeed in manufacturing 2200 yards half-fine thread from 1 tola copper wire, and also, in manufacturing diamond dies.

(*e*) The Department of Industries should also, continue further investigations as to the possibilities of improving wire drawing processes at Surat. However, this is not so important a suggestion that requires our immediate attention when it is realised that of late some of the Benares artisans have come over to Surat. They are experts in making thick wires ('Chakkars') out of silver ingots and Surat people have by the by picked up their method and process. As it is, Surat merchants have practically stopped sending silver ingots to Benares since 1938.

(*f*) Internal competition, among small karkhandars in obtaining out work and amongst the labourers for retaining the employment, has resulted in lower remuneration. This competition can be removed by a co-operative organisation. Attempts in this direction should be made after first improving the technique as well as the marketing conditions of this industry.

(*g*) In addition, in order to encourage this Gold Thread Industry the Government should remove the import duty on silver.

COTTON GINS AND PRESSES IN GUJARAT

There are in Gujarat about 250 cotton gins, 90 cotton presses and 25 combined plants of cotton gins and presses. They employ in all about 24000 persons. Even their actual survey within the 67 per cent area of Gujarat gives us the following figures :—

Cotton gins 210, cotton presses 76, and, combined plants of cotton gins and presses 22, and in all they employ about 21584 persons. This will be easily realised from the following table :

British Gujarat	Gins	Persons employed	Presses	Persons employed	Gins and Presses combined plants	Persons employed
[1] British Gujarat	112	9243	43	2113	11	1083
[2] Baroda (excluding Amreli and Okhamandal)	77	5252	29	1317	11	946
[3] Cambay : 5 g., 1 p. ; Balasinor 1 g. ; Rajpipla 8 g., 2 p. : Mansa, 1 g.; Radhanpur 6 g. 1 p.	21	Figures not available. Our estimate on the above average of British Gujarat and Baroda 1470	4	Figures not available. Our estimate on the above average of British Gujarat and Baroda 160	...	...
Sant, Lunawada, Bansda, Palanpur, Ilol, Jambughoda	...	...		...	...	...
*Total	210	15965	76	3590	22	2029
Rest of the Gujarat Our Estimate	40	2800	14	560	3	272
	250		90		25	

Messrs. Vakharia Brothers and Narandas Rajaram are the owners of a number of cotton gins and presses in Gujarat. In addition, there are also individual owners of one or two gins or a press distributed at its various centres.

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1. Figures taken from the Seasonal Factories List for the British Districts.

2. Figures taken from the Large and Small Scale Industrial Establishments in the Baroda State during the year 1936-37.

3. Figures taken from Administration Reports of the States concerned.

It would be interesting to note here that in addition to the figures mentioned above there is one ginning of cotton and oil extracting factory at Harij in Baroda employing 13 persons, and that, one of the ginning factories in Kaira is having combined plant of Rice Huller.

Often the small owners of gins and presses indulge in cotton speculation and get involved in huge debts. Rate War also exists among themselves in order to attract more work. Consequently the interests of the industry as a whole, suffer. There is, therefore, a need to establish an Association of the Owners of Cotton Gins and Presses in Gujarat to (1) safeguard their legitimate interests (2) stop unhealthy competition and (3) promote the welfare of the industry by laying down uniform rules and regulations.

The owners of the Cotton Gins and Presses also inquired from us about the possibilities of utilising their plants, as out of season they are lying idle. It will definitely be a very helpful and welcome sign if the State evinces concern in the well-being of the seasonal factories and investigate into the possibilities of utilising their idle plants. Out of season these plants are lying idle but this needs expert technical investigations in the absence of which it is very difficult for us to suggest the ways and means to make use of these plants for some sort of industrial activity.

CHAPTER VIII

WOOD-WORK

ACCORDING to the census returns those engaged in the industries connected with wood number 36,575. The main heads under which this number is distributed are Carpenters 23,925, Basket Makers and those in other industries of woody materials 10,958, and Sawyers 1,654. However, sawyers do not really constitute an industry. They are wage-earners who are engaged by contractors and are mostly found in the forest districts.

Carpenters of course form the most important artisan class of Gujarat, and, carpentry is both an urban and a rural occupation. Generally carpentry as such is a cottage industry but carpenters are also found employed in engineering workshops and large textile mills which form a part of large scale industry. We shall first deal with those art crafts of Gujarat which (even though employ in all a few hundred people) are deserving all encouragement as they are the specialities of Gujarat and if handled scientifically are capable of further development.

WOODWORK OF VISNAGAR

Visnagar's has become the watchword and hall mark for the wood carving craftsmanship. However, only one expert artisan, Mistri Narotam Kalidas is responsible for this beautiful carving of the wooden figures of camel, buffalo crocodile, elephant, lion, bear, etc., etc. They are so beautifully carved that one is at once wonderstruck at the art of the carver.

Mistri Narotam's father took some training at the Sir J. J. School of Art at Bombay and then went to Deesa Camp to engage himself in furniture making to meet the requirements of the Deesa Camp. However, as he did not obtain enough work he began to make camel and the elephant stands in spare time and earned a name for his craftsmanship. As Deesa Camp was closed, in 1906 he came to Visnagar and continued his work. At present his son who learnt this art from him, is handling this work. As he is able to maintain the contact with the old acquaintances his father had made, he receives some orders from outside places. However, day by day the number and value of the orders received are decreasing. About 10 to 12 years ago he used to employ 6 to 7 workers to help him. Now he hardly employs one artisan, and that too, for two to three months in a year. He is thus losing his hold over the market.

He can make the figure of a buffalo 6" x 10" x 3½" (by putting in per day 8 hours' effort) within 7 days. He takes two days in making the rough shape, four days to carve out the figure of the buffalo from that rough shape, and one day to prepare the stand on which buffalo figure rests. All these days the artisan who helps him is paid Re. 1-8-0 per day. He requires the help of the artisan for five days. The wood costs Rs. 8 per cubic feet which comes to annas 14 for the buffalo figure. The labour charges amount to Rs. 7-8-0; packing and other miscellaneous charges come up to Rs. 1-4-0. He obtains Rs. 18/- for this buffalo figure. His daily earning is about Re. 1-4-0 and monthly income Rs. 40/-. His yearly sales hardly come to Rs. 1000 to 1200/-. His annual requirements are :—

Rs.	225	Wood (blackwood and teakwood).
Rs.	50	Nails, etc.
Rs.	2-8-0	Mukhmal cloth 1 yd x 18".
Rs.	3-0-0	'Banat' woollen cloth.
Total Rs.	235-8-0	

While his implements are hardly worth Rs. 100/-. This expert artisan requires markets for his goods. He requires some State effort to advertise and popularise his goods in the foreign markets. All possible steps to preserve this art should be taken by the State. He wants teak and blackwood of required size at reduced or low rate from the Railway Department, as they are the principal raw materials used by him.*

WOODWORK AT BANSDA

Another artisan who has earned for Bansda Cottage products praises from all the nooks and corner of Gujarat is Mistri Morar Bhagwan. He makes very beautiful smooth polished and attractive 'polla balls' and buttons from bamboo roots. In addition this artisan is expert in lacquer work, and, he makes electric stands, fountains, gulābdānis' of beautiful models and fine designs. From 'tumbdā' wood he prepares wind instruments 'mādal', 'tur', 'tuntuniā' which are his special products. He has earned many medals for craftsmanship, skill and intelligence. He is, however, unable to eke out even a minimum subsistence from his occupation. He is indebted to the extent of Rs. 300 to 350 and is a fish out of water at Bansda. The wood work of Visnagar and bamboo work of Bansda will die out with the passing away of the above two Mistris. All possible steps should be taken to make them comfortable and also to assure other workers for future to get apprentices trained under them. Gujarat is famous for her art of wood carving, only because of these two artisans (1) Mistri Morar of Bansda and (2) Mistri Narotam of Visnagar.

SANDALWOOD CARVING

Surat happens to be the home of sandal wood carving in Gujarat. About 20 years ago there were something like 17 shops employing about 60 artisans in sandalwood carving. The trade was greately patronized by Mr. Fakirchand Rughnathdas, Ivory Merchant, at Delhi. From 1922 to

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*It is really gratifying to note that the Baroda State has recently established Jubilee Cottage Industries Institute, wherein (1) calico printing, (2) block engraving, (3) lacquer work, (4) metal work, (5) leather work and (6) Visnagar brass metal and wood engraving is being taught, 1927 he went on making heavy purchases from the sandalwood carvers of Surat, and, his purchases gave a good fillip to this art craft. However, later on depression overtook this industry and the yearly purchase of Mr. Fakirchand which once stood at Rs. 8,000 to 10,000 came down to Rs. 2,000 to 3,000. This had a very bad effect upon the remuneration of the sandalwood carvers of Surat, which were gradually declining. The artisans at Surat were, therefore, discouraged for they found that it was not worth while to work out this industry which required constant concentration, exactness and skilled labour. Hence with the fall in the demand of the sandalwood wares they gradually gave up this industry. In consequence there are now only 6 shops of sandal wood carvers at Surat in which we find only 18 artisans at work.

The sandalwood carvers of Surat have earned a name for their artistic and beautifully carved caskets; for their designs on sandal wood boxes; for their carving of " Samudra Manthan " on the lid of the boxes, and, on four sides of the boxes beautiful depiction in figures of the history of Ramayan surrounded by elaborate carving of running design of leaves and flowers. The beauty of this carving is that overlapping of one stem against another is very delicately done, without breaking a single stem of the leaf. The fame of these Surat carvers has travelled not only in India, but to Europe also, for their beautiful presentation articles.* They make jewel boxes, writing boxes, presentation boxes, trinket boxes, cigar boxes, caskets, etc., and in addition these carvers also do the inlaid work.

This art of inlying is fast dying out, and proper steps to preserve it need to be taken. The artisan cuts long and very thin bits of tin, ivory, black, red and yellow wood to the length of 2 ft. He binds them together with glue in the

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*For further information *vide* Report on Art-crafts of Bombay Presidency. by G. P. Fernandes, pp. 59-61.

shape of hexagons and octagons. When dry they are cut into thin slices which are formed into triangles, squares, hexagons and diamonds. Then they are placed in such a manner as to form intricate geometrical designs.

As for the raw material required by the sandal wood carvers Mr. Chhaganlal Bhanabhai Pettigara informed us that he used to purchase Mulbarry sandal wood, 'sisam' or black-wood, 'haldarvo' or yellow wood, 'sabarsing' or reindeer horn and teak wood from local merchants, while 'abloos' or ebony, 'ratānjalo' or red-wood, and 'patang' from Bombay. He used to purchase Ivory either from Navsari or from Bombay, tin (kallai) from Surat or Bombay, while glue (sares), colours, 'mukhmal' cloth, small hooks and hinges for boxes, etc., from Surat.

His implements were hardly worth Rs. 30/-.* From his account books it could be realised that he had spent in the year 1937-38 :—

Rs.	384	0	0	for raw materials†
„	270	0	0	wages to the artisan Rs. 22 8 0 per month
„	434	0	0	wages to the workers engaged on piece-rates for doing inlaid work or making designs, etc.
„	90	0	0	packing, cardboard boxes, wooden boxes, stationery, wear and tear of implements, etc., etc.
„	1178	0	0	Total cost.

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* His implements were 4 'aris' of Rs. 20, two sets of 'farsi' Rs.1-8-0 'korani' (carver) of Re. 1-8-0, four fine files of Re. 1-0-0, four big files of Rs 3-0-0, and many 'tānkanās' (needles), 'pāniyā', 'Guchha', 'chhidri', 'ār', etc., etc., of Rs. 2-8-0, and sand papers (0-0-6 each) of 0-8-0. In all implements worth Rs. 30/-.

† Rosewood (blackwood or 'sisam') 8″ × ½″ × 4 ft. Rs. 2-0-0, Ivory 24 ratal Rs. 120-0-0, 'Sukhad'—sandalwood 180 ratal Rs. 117-0-0, 'Sābar Sing' 60 ratal Rs. 15-0-0, 'Abloos',—ebony or black Ivory 30 ratals Rs. 7-8-0, 'Sāgvān' 30 ft. × 5″ × ½″ Rs. 3-12-0, patang 6 ratal Rs. 1-8-0, Haldvan (yellow wood) 48 ft. (at = 0-4-0 per sq. in.) Rs. 12-0-0, Kallai-tin 36 ratal Rs. 72-0-0, colour, 'jangāl Rs. 5-0-0, glue or 'sares' 12 ratal Rs. 4-8-0, 'Mukhmal' 0-10-0 per yd. of 36″ width 6 yds. Rs 3-12-0, Hinges hooks silver gilded 8 dozen Rs. 20-0-0.

His production and sale proceeds and balance of raw materials in the stock for the same year were as follows :—

Production					*Sale Proceeds Realised*		
					Rs.		
Money boxes,	half sandal wood and half ivory	96	boxes	6″×4″×2¼″	559	0	0
do	whole ivory	18	do	6″×4″×2¼″	80	0	0
do	whole sandal wood	6	do	6″×4″×2¼″	50	0	0
Pin boxes,	half sandal wood and half ivory	74	do	6″×4″×2¼″	518	0	0
do	whole sandal wood	10	do	6″×4″×2¼″	80	0	0
Handkerchief boxes	half sandal wood and half ivory	18	do	9″×6¼″×3¼″	234	0	0
do	whole sandal wood	3	do	9″×6¼″×3¼″	45	0	0
				Rs.	1,566	0	0
	Surplus raw material with him			,,	19	13	0
	From Commission, etc.			,,	34	6	6
				Rs.	1,620	3	6

His net earning, therefore, was Rs. 442-3-6 which meant hardly Rs. 36 per month. To obtain only Rs. 36 from an art-craft requiring a steady hand and eyes of a master craftsman is not at all encouraging.

This industry according to the artisans of Surat requires about Rs. 2500 worth of raw materials and Surat's output of ready made goods is estimated to be worth Rs. 10,000/-.

Hence, there is an urgent necessity to devise ways and means to increase their share of remuneration. Their main markets are Bombay, Delhi, Calcutta, Lahore, Amritsar and Rawalpindi, and, these manufacturers of Surat inform us that the industrial concerns of the above centres which purchase goods from them and sell in their local markets, keep a bigger margin as middleman's profit. If, therefore, some Government depots were opened up at the above centres this profit will be realised by the sandal wood carvers. In the absence of local markets, these Surat artisans are at the mercy of the upcountry firms. If no immediate steps are taken in this direction, this art will not only deteriorate, but, it is probable that it will die out with the extinction of the present carvers. Measures to popularise their goods in the foreign cities should be adopted in order to widen their markets. Messrs. Pohumull Brothers, Tarachand Parshram and Hiranand Valliram at Bombay or Fakirchand Rughnathdas, Delhi being their good customers might be able to enlighten the Government Department* as regards the taste of the customers of these goods, or the possibilities of developing markets in foreign countries, etc.

SANKHEDA LACQUER WORK

The only important centres for lacquer work in Gujarat are Sankheda and Bahadurpur. The 'Ghodia', 'Pārnā', 'Chhatrapalang', 'Devnā Hindolā', (that is, cradles, cots, etc.), chairs, 'Bājath', 'Sinhāsan', coach, 'Patla, sticks, 'Velan', 'Sāmbelā', (Kacholā', 'Kankāvati', wooden toys like 'Kuladi', 'Bhamardi', 'Chakkardi', 'Ghugharā', play toys—and 'sogathā' (that is dices) these are the main articles made at these centres.

Recently the artisans of Sankheda and Bahadurpur, have also started making 'tea-poy', 'flower pot', 'lamp-stand', photoframe, 'attardani', 'gulabdani', etc.

The artisans of Sankheda inform us that upto 1917-18 they were able to sell goods worth Rs. 10,000 per year. But at present they are hardly able to sell Rs. 4 to 5 thousand worth goods per year and they remain unemployed for 2 to 3 months in a year. They sit idle as their stock accumulates. Rs. 400/- worth goods is kept by them in Baroda Museum for advertisement. But the 'Vikriyalaya' (the sales depot) of the State stocks only Rs. 100 to 150 worth goods from them. After selling this stock the ' Vikriyalaya ' that is the Cottage Industries Sales Depot of the Baroda State asks for the further stock of the same amount. In this connection, it would be desirable that if the State purchases the goods from the artisans on cash and then stocks them for sale in its ' Vikriyalaya ' instead of first taking them on credit, and giving the money to the poor artisans after the sales realisation. The State has not to invest much while the artisans will receive cash payments. These artisans are illiterate and not properly trained ; they, therefore, need direction about carving the new designs, new shapes and new figures. They also want to learn the art of painting. In order to suit the taste and the requirements of the Indian as well as foreign markets all the necessary guidance should be given to them. Otherwise their art is deteriorating, and their hold over market is fast declining.

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*Department of Industries.

More important problem is the problem of preserving the art of making tin colour (or ' kallaino rang '). There are 15 families of Kharadis at Sankheda, and in all 20 artisans who know lacquer work, but out of them only 6 artisans know the art of making tin colour. First the artisan applies light colour (kăchorang) upon the wooden article and then draws a foliage (' vel ') by tin colour with the help of a fine brush. Upon this tin colour he then applies fast lac colour. But the preparation of tin colour is their trade secret.

They want (*a*) one ' Petch Patli ' (implement to make holes), and (*b*) they urge that wood should be made available to them at cheaper rates. Dudheli wood is mostly used by these artisans and it is imported from Chhota Udepur and Bulsar. Their annual requirements are Rs. 1000 to 1500 worth wood as raw material ; Rs. 200 worth lac ; and, Rs. 50 worth tin. They urge that the duty on the imports of wood should be removed.

Baroda State has begun to evince interest in the lacquer work of Sankheda by trying to introduce bright colours, better quality wood, better quality lac, etc. in the manufacture of the wooden articles and various new articles like book shelves, paper weights, pin-cushions, etc. are also introduced. But much remains to be still achieved in the field of wood carving. There is also the necessity of introducing lathe at Sankheda, but because there is no electricity at this centre, it is not possible. Hence the Kharadis have to make the farmas (models) by hand process. Much time is, therefore, wasted in making the models.

Added to these, there is hardly any centre worth mentioning for wood work or lacquer work in Gujarat.* However, mention should be made of the lac bangles of the Panch Mahals and also the special Mistris of Visnagar and Ahmedabad who devote themselves mostly to the temple work.

LAC BANGLES MAKING

Panch Mahals is noted for the preparation of lac bangles. However, these bangles are not so attractive as the workmanship, design and finish are quite ordinary. The lacquer work in this part of Gujarat is of inferior quality when compared with the highly artistic work of Sind.

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*The art of wood carving was once renowned and was once carried on in Patan on an extensive scale and a visitor can yet see good carved wooden materials used to decorate the front positions of the old houses. But owing to want of encouragement the art is almost dying out ; *vide* " A guide to Patan " by Mr. M. M. Joshi, Esq., B A., LL.B., (1926).

Carpenters at Surat are mostly engaged in ' Kadiakam '. There are very few engaged in wood carving, in lacquer work, or in preparing toys. That too most of the lacquer workers have come from outside. Some 60 years ago carved artistic furniture in blackwood was done at Surat. There are still some remnants of the wood carving in some of the old homes at Surat. At resent, however, this work is not carried out at Surat.

At present there are 4 shops of ' lakharas ' at Dahod, 7 at Jaswada, 2 at Gangardi, 3 at Gadbārā and a few at other centres.

These artisans who are known as ' Lakhārās ' (that is Lac workers) make the bangles at their homes. They require lac as the raw material. They purchase raw lac in crude form that is made available to them from the forests. This raw lac contains wooden chips, sand, etc. Hence, if they purchase 3½ maunds lac, they find 2 maunds 25 seers pure lac, remaining in the balance, the rest being wastage (about 10 seers is the wastage per maund). As raw lac in crude form is available at Rs. 3/- per maund the above raw material costs Rs. 10-8-0. However, to add to the colour of bangles and to see that they become hard and the colour remains fast they prepare a solution containing ' chandras ', ' sindur ', ' safedo ' and ' kāligari '.* Generally these ' lakhārās ' make 3 kodi bundles of lac bangles (each of 25 bangles) at a time. They require Rs. 2-12-0 worth ' chandras ' and other materials. On the first day they melt lac, second day they prepare lac sticks, on the third day they try to prepare lac bangles in raw form by trying to wind these sticks on a round cylinder to which required amount of heat is supplied from below. In the process they also apply solution of ' chandras ' to make the bangles hard. In all eight days are taken to prepare three kodi bundles of bangles. However, there are certain processes requiring

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*From lac 3½ maunds three kodi (60 bundles of 25 bangles each) can be prepared and for this :

1	seer Chandras	...	...	Rs.	1	8	0
1½	do Sindur (0-6-0 per seer)		...	,,	0	9	0
½	do Safedo (0-12-0 per seer)		...	,,	0	6	0
⅛	do Kaligari (0-10-0 per seer)		...	,,	0	1	3
				Rs.	2	8	3

additional help. For making 3 kodi bundles[*] the following expenditure in incurred :—

Rs.	10	8	0	Raw material (Lac)
Rs.	4	4	0	Labour charges for giving shape to the bangles at the rate of Re. 1 for 28 'gharas', (and one kodi ghara or bundles means 40 bundles).
Rs.	3	0	0	Labour charges for applying 'tikis', to bangles (special process at the rate of Re. 1 for 40 gharas).
Rs.	3	0	0	Labour charges to make yellow design on the bangles (at the rate of Re. 1 for 40 gharas).
Rs.	2	12	0	'Chandras', 'Sindur', 'Safedo' and 'Kaligari.'
Rs.	1	8	0	Sundries, fuel, etc.
,,	25	0	0	Total cost.

Generally he brings fuel from the forests, and, does not spend anything after it. With Rs. 25 expenditure he gets ready 3 kodi 'gharas' ('bhungalās' or bundles) of 25 bangles each ready for sale. He sells these bangles for Rs. 10 a kodi bundles and obtains Rs. 30. Hence, after 12 to 13 days' strenuous work he earns Rs. 5 from this industry. On this basis he can make Rs. 600 to 700 worth goods if he remains busy and gets orders throughout the year. But now the demand for lac bangles has fallen and only for two months[‡] in winter there is brisk season for sale, then a lakhara is able to sell 6 'sellas' or 'gharas' on an average per day. Hence 360 'gharas' (bundles each containing 25 bangles) during this brisk season, while on other days he sells hardly 6 bangles on average—which means hardly 60 'gharas' he sells during the rest of the year. Only 420 'gharas' he is now able to sell per year which means hardly Rs. 210 worth sales, or hardly 5 months' work.

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[*] One kodi 'ghara' = 40 'ghara' (bundles — 'bhungalas' of 25 bangles each) or bundles.

[‡] 'Maha' and 'Falgun' months.

The economic condition of these lakharas, therefore, has worsened. "Our forefathers used to earn Rs. 10 to 11 per month and could sell Rs. 600 to 700 worth bangles, and remained busy throughout the year. We hardly remain busy for 4 or 5 months in a year and we cannot sell more bangles for their demand has fallen." This was the cry of the Lakharas. They, therefore, have begun to sell ready made cocoanut bangles imported from Ratlam, wooden and horn combs made by Marwari artisans, and in addition they import Indian as well as foreign glass bangles; still they hardly earn Rs. 8 to 10 per month from their work.

If the artisans are trained to prepare beautiful carved wooden bangles with lacquer work,* or some attractive bangles from the point of view of designs, this indigenous industry will develop to a certain degree. As such the use of lac bangles is fast giving way and it is simply marking time for its extinction.

TEMPLE WORK

About 10 Mistris (carpenters) were engaged in temple work at Visnagar a decade ago. But only two have now remained, who devote themselves to the carving of the wooden idols to fit in the pillars, doors and seats of the dieties in the Hindu temples. These carpenters also do silver work on the wooden idols. At Ahmedabad there are 9 artisans who know this art. These artisans get orders mostly from Jain, Swaminarayan and Vaishnav temples.

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*Lakharas of Panch Mahals at times are sticking imitation pearls, glass pieces, cronches or at times applying 'varakh' (or 'pittal pani' brass leaf) to add to the beauty of the bangles. Yet the way in which they apply them is very crude and they require guidance in giving bright colours to these bangles and in adding to the beauty of their shapes.

They require timber (Bulsari ‘sag’) and silver nails which they themselves make from silver wire.

For making a “Rakhval” (door keeper) of Rs. 40 worth a carpenter takes eight days for carving and eight days more for silver work. The cost of the “Rakhaval” comes to :

Rs.	5	0	0	2ft. (ht.) × 10" broad × 7" thick wood (sag), that is 1¼ cu. ft. timber (1. cu. ft. = Rs. 3-8-0).
Rs.	3	0	0	Silver nails (‘Mekho’)
Rs.	8	0	0	Total cost. His income comes to Rs. 2 per day.

It should, again, be remembered that there is no certainty of orders. Mr. K. H. Mistri who was interviewed by us at Visnagar gave out that he used to get Rs. 16000 to 18000 worth orders before a decade and a half, wherein he used to earn Rs. 2000 or more. At that time he used to employ 2 or 3 artisans on daily wages for 2 to 3 months in a year. But now he hardly gets orders for Rs 7000 to 8000 and hardly earns Rs. 1000 a year, therefore, he does not employ any artisan. Dwarka, Mathura and Delhi (Daoodji’s Vaishnava Mandir) are the important centres from which he received orders. On the whole this type of work is needed less and less as the years roll on. What is, therefore, required is to incorporate the art of such artisans for some other work, say, for making toys, etc. Kharadis of Idar and Godhra prepare some wooden toys but they are not so attractive, moreover, most of them do engage themselves in making of wooden cots, etc. Hence their condition is studied separately. What strikes us is the miserably low number of wood carvers in Gujarat hardly reaching 100.

From the point of view of education toys play an important part. As Professor Kumarappa says “To give foreign toys to our children is like inviting foreign nurses to breed them". Our markets are glutted with Japanese, German and other toys. Hence a right and earnest move in this direction will not only open a new field for these artisans, but it will also revive the decaying skill of our artisans.

WOODEN BRACELETS MAKING

Mention must here be made about the bracelet making at Lunawada and Santrampur. Once wooden bracelets were also made at Cambay and exported outside but now it is practically extinct. However, at Lunawada about 5 Kharadis and at Santrampur 2 Kharadis prepare bracelets (baloyās) either from 'Dudheli', or from 'Sar' or from 'blackwood'. These wooden bangles are favoured by the Kanbi, Koli, and Khat females on this side. The use of glass bangles is, however, fast displacing the wooden bracelets. They are crude and no carving is done at all on those bracelets. Sometimes brass strips are applied over these bracelets. These wooden bangle makers at Lunawada and Santrampur hardly earn Rs. 4 to 5 per month from the bracelet making; they, therefore, do other Kharadi work also; and make hangers (khuntis), adanis, velans, etc. If these artisans are shown as to how to make more polished and better shaped bangles perhaps the public taste will be revived in these wooden wares.

It should be noted that in Panch Mahals at Dahod, Zalod and a few other centres, cocoanut bangles are imported from Ratlam side to meet the requirement of the Bhil females. In order to make cocoanut rim more attractive 'varakh' or 'pittalpan' (brass leaf) is applied on its outer surface. Except one artisan who has come to stay at Limdi (Zalod) and makes these bangles, practically no cocoanut bangles making is undertaken at any other centre in Panch Mahals.

Shops at Dahod, Zalod, etc., which are selling lac bangles import some cocoanut bangles and sell them.

But after 1920, because of the command of the Bhil Mata (Goddess whom all the Bhils believe), use of cocoanut bangles has been fast declining. As the cocoanut is to be presented to Mataji, the use of bangles from cocoanut, which is a very pious or holy fruit, by Bhil females is not desirable. Hence Bhil Mata has forbidded their use.

WOODEN DIE MAKING

The same is the case with the makers of wooden dies in Ahmedabad. There are about 18 shops engaging in all 100 artisans in the work of die making. Die making is concentrated at Ahmedabad, but it is now one of the decaying industries of Gujarat. As long as calico printing as a handicraft was in a flourishing condition, die makers were flourishing. When inquired about the present economic conditions of the industry one of the independent artisans at Ahmedabad gave us the following idea :—

His implements were simple, and they were hardly worth Rs. 25/-. He did not incur much expenditure by way of their wear and tear. As for the raw materials handled by him during the year 1938-39 it was timber worth Rs. 100/-. But in dies making Rs. 50 worth cut pieces of old sizes were wasted; that is, enough wastage of raw material occurs in this industry. For the year 1938-39

He purchased timber worth	... Rs.	100	0	0
Spent after the implements	... „	10	0	0
Lost as bad debt ...	... „	80	0	0
He incurred total cost	... „	190	0	0

He made dies in all worth Rs. 500. His annual earing was Rs. 308. Every year he had to let go some amount as bad debt. This default of payment by the customers worried him the most. For, the calico printers who happened to be his customers were in the habit of purchasing on credit. He was earning about Rs. 300/- per year from this industry, which means, Rs. 25/- per month. As long as calico printing survives these die makers will survive; unless, however, calico printing is given a fillip as a handicraft, the die makers will not have any market.

WOODEN AND HORN COMBS MAKING*

Mostly the wooden combs and horn combs are imported from Udepur and Ratlam side by the inhabitants of the Panch Mahals. This tract being poor, its inhabitants cannot afford to go in for celluloid combs, which are dear and are likely to break early. But during the last decade some Marwaris have come over to Dahod, while some have settled themselves in the interior of the distrtict. They make the combs from blackwood and from horns, and cater for the needs of their own village as well as the adjoining villages. They earn Rs. 4 to 5 per month from this occupation. Looking to the demand this industry is capable of further development in the Panch Mahals. If, therefore, these comb makers are guided in preparing better quality, attractive, polished combs, or in preparing combs with attractive designs, they will find more markets in Gujarat.

BOBBIN MAKING

There is only one bobbin-making concern in Gujarat and it is at Navsari (Baroda State). The 'Karkhandar' here employs about 100 workers on a contract basis, and prepares bobbins and wooden articles required in textile mills and ginning factories.

His equipment consists of an oil engine, a bent saw, an automatic turning lathe, etc. Three-fourths of the wood utilised by him is imported from the United States of America, Germany and Canada, and only ¼th is the Indian. He concentrates more on preparing wooden parts required in the cotton textile mills, whereas bobbins making form a small part of his manufactures.

This business has ceased to be profitable because of (1) the heavy duties on imported wood (which penalises the local industry vis-a-vis foreign producers), (2) the unduly burdensome freight charges on the carriage of the raw material from the port to the interior and (3) very high electric charges at Navsari (so much so that he was obliged to go in for an oil engine). When, therefore, the price of crude oil has gone on increasing during recent years, he found that with his high cost of production he was unable to compete with the Japanese products.*

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*"Kanski" making.

This is the only concen producing bobbins in Gujarat, and hence, it is desirable that the state authorities should evince sympathetic concern in its well-being.

CART MAKING

Cart making once formed one of the imortant main stays of urban as well as rural carpenters. However, the demand for the carts, for transport of goods, as well as passengers, has greatly declined, and during the last 30 years they are no longer in great demand.

Hence the main function of the rural carpenters now is to make the agriculturists' implements or to repair them and to make cart wheels or to do cart repairs and to do building work when there is demand for it.

Formerly he used to make tools required by the rural artisans like 'Charkhas', 'Patras', (wooden boxes) etc., but as many of these cottage industries have declined he has lost most of his previous work. Specialised carpenters in the coastal district used to make 'Machwas' or sailing boats, but they are also in a bad way, as sailing ships are largely giving way to other more efficient means of transport.* 'Kadia Suthars' or the carpenters engaged in building construction are recently hard hit in their occupation because of the import of ready made doors and windows. Under the circumstances, the earnings of rural carpenters have gone down cosiderably and they vary from Rs. 10 to Rs. 20 per month. Their position is getting worse and some new avenues require to be found for them in order to stabilise their position in the rural economy of the province.

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*If the present war has mitigated the foreign competition to a considerable extent, it has rendered more difficult the problem of raw materials. Hence he requires some guidance urgently from the Government experts in this connection.

The earnings of carpenters engaged in a larger organised industry or in the urban building industry are of course much higher. They are also finding new scope in the furniture industry or in motor body building, etc., but such avenues are not available to the rural carpenters.

Though Bulsar, Surat, Kalol, Radhanpur, Vadali, Vankaner and Kadod are the cart making centres of Gujarat, its more important and better known centres are Talaochora, Mandvi, Valam, Vyara, Godhra, Bhalej, Amod and Palanpur.‡

Amod and Palanpur have specialised more in making light carts (passenger carrying carts i.e. 'Damanis', while other centres have mostly concentrated in making heavy carts ('Mālgādis').

One of the artisans interviewed at Bansda informed us that he required 'Tanchh', 'Sag', and 'Kher'. For the body of the cart especially 'Tanchh' is used, while for wheels 'sag' and 'kher' wood are used. As timber is exported in large quantities from Bansda forests, carts continue to operate in that zone from the railway stations to the forests.

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* Only a few families on the coastal side know this work and occasionally they get some orders from the private clubs or kings to make a small 'hodi' for their boating in lakes, rivers, etc. Otherwise these people are either working as sailors engaging themselves in fishing.

‡ Other important villages of the Palanpur State are Sāsan, Tākarvādā, Lakhampurā, Chadokhā and Jagānā.

This artisan who was interviewed by us kept himself busy throughout the monsoon cutting wood and preparing the sizes (cut pieces) of suitable requirements.

One light cart body which he sold fetched Rs. 13. It had taken 4 days and that too when he took the assistance of one worker whom he paid annas 10 per day. The wood (raw material), etc. cost him Rs. 2-8-0, and, he paid Rs. 2-8-0 to the worker who assisted him. His net income was thus Rs. 2 per day. However this income he obtained for eight months, as throughout monsoon he used to cut the wood into pieces of required sizes. Hence his monthly average income was Rs. 40/-. The same light cart body used to fetch Rs. 50-65, 20 years ago, and the assistant artisan used to get Re. 1-8-0 to Rs. 2-0-0 per day. Only 6 carpenters are engaged in cart making at Bansda, while the others about 25 work in the Public Works Department of the State and earn Rs. 15 to 30 per month according to their efficiency. Because of the existence of forests cart transport has been able to hold its own in the Bansda State; moreover, Bansda itself is not on the railway route. Hence the timber has got to be taken to the nearest railway station in carts. Cart making is, therefore, in flourishing conditions here and have recently come to stay at Bansda. About 200 carts operate between the forests of Bansda and the Stations: (1) Anaval (Baroda State), (2) Unai (3) Kevdi (Baroda State), and (4) Waghai (British).

The leading centre of Gujarat for cart making is Talaochora. Formerly there were 35 shops ('Kods') maintaining in all about one hundred artisans. But at present there are only 11 shops ('kods') maintaining in all 36 workers (11 proprietors plus 25 artisans employed by them.) Mistri Bhaga Premā who was interviewed, informed that their season to get orders began from October and continued upto April. During the rainy season these artisans make from wood the cut pieces of required sizes. They receive orders even today from distant places like Nandod (Rajpipla), Ankleshwar, Hansot; and, they share almost all the orders of the Surat District with Māndvi. The raw material and other things for a cart of good quality cost as under:—

(1) Wood[1]	Rs.	22 0 0
(2) Other Material[2]	Rs.	6 0 0
(3) 'Lokhand' (iron)[3]	Rs.	22 0 0
(4) Blacksmith's work and labour[4]	Rs.	5 4 0
	Rs.	55 4 0

This cart is usually sold at Rs. 100/-. But the artisan takes full one month to make this cart. He, therefore, earns Rs. 45 a month. That too, if the wood of the required size is ready. The artisan who was approached by us said that 20 years ago the above cart used to fetch Rs. 150 to 175. Hence he used to earn Rs. 100/- per month. But with the decline in cart traffic in general throughout the province, his remuneration was curtailed due to the fall in the price of the cart. If, therefore, 4 months of monsoon, devoted by him for cutting the wood and making its pieces of required sizes, are taken into consideration, his income hardly comes up to Rs. 30 to 35 per month.

The same is the condition prevailing at Mandvi, Palanpur and Vyara. If the cart transport is encouraged, these centres will be able to hold their present position, otherwise we shall shortly hear about the decline in the number of artisans engaged in the cart industry of Gujarat.

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[1] Wood :—Kher Rs. 4, Tanachh Rs. 12 ; Sag Rs. 4.

[2] Other Materials :—"Langan", 'Vātali', 'Sidhvo', 'Pānjarā' (in all Rs. 2, 'Junsari' Rs. 4.

[3] 'Lokhand' (Iron) :—'Khilāsari', 'Pātā', 'Chhadpatti', 'Fuladi' (of brass), etc., etc., Rs. 22/-.

[4] Blacksmiths' charges for preparing:—'Kadi', 'Pech', Āman' and 'Mori'.

'KHARADI' WORK

In Gujarat those carpenters who prepare wooden cots, their legs, (pāyā, insh, umpalā), cradles, and other household necessaries like 'Velan', 'Adani', etc., required for cooking purposes, are known as 'Kharadis' or 'Sanghedias'. As far as the number employed is concerned 'kharadi' work gives employment to a larger number than to cart making in Gujarat.

Ahmedabad, Godhra, Idar, Surat, Lunawada, Radhanpur, Palanpur, Patan, Balasinor, Modasa, Santrampur, Chansmā and Sankheda these are the outstanding centres of Gujarat in this connection. However, the most welknown of these are *Godhra* (30 shops) where if outworkers (100), dalals and others are taken into account about 250 persons are engaged in this industry ; *Idar* (25 houses) where about 80 persons are engaged in this work ; *Ahmedabad* where about 75, and, *Surat* where also 75 artisans are engaged in Kharadi work. Godhra is the leading seat of this industry in Gujarat.

Mr. Harkhābhāi Tulsibhāi Kharādi who was interviewed by us supplied the following information. His instruments* were worth about Rs. 100/-. For the year 1937-38 he required Rs. 5000 worth local timber from Panch Mahal forests, in addition Rs. 5000/- worth (Malbari Rs. 4000/- worth, and, Deshi Rs. 1000) he had imported from outside. In addition he required about 10 maunds lac which meant Rs. 110/- plus red, green and yellow colours' tins, in all worth about Rs. 8/-†. By way of salaries he had distributed

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*Implements required by him are "Vinzano", 'Nakhalā', 'Karvati', 'Hathodi', etc.

†Red 1 ratal tin at 1-10-0	Rs.	1	10	0
Green ¼ ratal tin at 1- 2-0 per ratal	,,	0	4	6
Yellow 10 ratals at 0- 9-6 to 0-10-0 per tin ...	,,	6	4	0
	Rs.	8	2	6

Rs. 2000/-. In addition he had paid Rs. 21/- house tax, Rs. 250 electric charges, and, Rs. 375/- railway freight. In all his expenditure amounted to Rs. 13,764-2-6. His sales proceeds were Rs. 15000 :

He prepared :	Cots	...	Rs.	8000	worth
	Cot Legs	...	„	3000	do
	Cradles	...	„	2000	do
	Chairs	...	„	1000	do
	"Khuntis" (Wooden hangers)	...	„	1000	do
			Rs.	15000	

Hence his net profit was Rs. 1235-13-6. This included the remuneration of the father and son who both worked as the artisans, and, the interest on the investment of capital, in raw materials, equipment, etc. Hence, if at the rate of 5 per cent interest Rs. 550 were deducted, then the sum of Rs. 700 is left, which means Rs. 30 per head per month to each. His main markets for these goods were Ahmedabad, Broach, Nadiad, Bulsar and Kathiawar in order of merit. Out of about 30 shops at Godhra only 7 are exporting on a big scale and it is estimated that Rs. 1,50,000 worth articles are made at this centre every year.

Idar happens to be the second best centre for Kharadi work, but as regards the size of the industry, Idar, Ahmedabad, and Surat put together can hardly compare with Godhra.

Idar Kharadis have mostly concentrated on the making of toys; they make 'velan', 'barani', 'Kankāvati', 'Ghugharā', 'Ghanti', 'gramophone', 'rān', 'ringanā', 'inda', (eggs), etc. mostly from the wood of 'dudheli' or 'dudhiya' tree. Other wood they prefer is either 'Mukhun' or 'Kado'. They make cradles from Bulsar sag. Main item of their sale are 'velan', 'ghugharā', 'stick', 'sogatā' (dices), 'balls', 'bats', etc., and, in their exports most important item is 'velan'. They make use of lac colour in preparing all the above articles; so they appear very attractive. For half the goods they produce, their market is Ahmedabad, and, for the remaining Surat, Bombay, Baroda and the places round about Dabhoi.

The independent artisans are able to earn hardly Rs. 25 to 30/- per month, and, what they need is the reduction or removal in the duty on the imported wood and guidance for making new and better toys as regards shape, design and colour.

COACH MAKING

Surat, Ahmedabad, Baroda and to a certain extent Bulsar are the important centres in this connection, where coach making concerns are still visible. At these centres in all 250 persons are engaged in coach making in about 50 concerns. At times, these concerns engage themselves in making carts or cart-wheels, etc. The demand for coaches has fallen greatly after the construction of roads to suit the automobiles in Gujarat. In consequence horse-breeding has also been neglected in the province. The coaches are mostly used as means of communication between one part of the city and another, where bus service is conspicuous by its absence; and also in reaching the residence from the railway station coaches are found to be more convenient as they carry goods as well as passengers. Hence the coaches are serving a subsidiary purpose supplementary to the faster means of communications.

The implements required by the coach making concerns are hardly worth Rs. 150 to 200/- and the raw materials upon which a coach maker works are iron, nickel or german silver, rubber tyres, chrome, coir fibres, and timber. When interviewed at Ahmedabad the coach maker told us that in making the coach which he had at hand he required

Rs. 60 worth timber, Rs. 45 worth iron (nails, screws, rails, etc.), Rs. 30 worth german silver, Rs. 30 worth rubber. In addition Rs. 30 he had to spend after colouring and Rs. 100 for chrome, coir, etc. In all, he took 30 days to make that coach which cost him in all Rs. 295/-. He was to get for this coach Rs. 360/-. Hence he will get Rs. 65 by way of remuneration. It took him one month to make that coach. As he was not likely to get orders for more than 5 or 6 coaches in a year, for the rest of the year he did repair work. 20 years ago the same 'coach' would have fetched him Rs. 400-425 and in those days he used to remain busy throughout the year in making the new coaches. At present this industry is suffering from depression because the bus-services and motor cars have replaced their demands to a greater extent. Under the circumstances the artisans in this industry are at a loss to suggest as to how to develop their markets.

MOTOR-BODY BUILDING

With the advent of the bus services in Gujarat we find at a few centres motor-body building is carried on on a limited scale. At Ahmedabad there are such four 'kārkhānās'. For motor body building if a good 'kārkhānā' is there, it has to employ its 'mochi', 'blacksmith', painter, and at least engage the services of 5 carpenters and one coolie. Thus about 9 to 10 persons work in a 'kārkhānā'. The tools or the equipments of the kārkhāndār consist of 'bhida', 'sigrā', bolts, screws, iron sheets, 'padadā' roller (curtain roller), etc., and they are worth about Rs. 500/-.

The Kārkhāndar who was interviewed by us at Ahmedabad had made 4 motor bodies in the previous month at the cost of Rs. 1438/-. His account books showed the following amount spent by him :

Rs.	400-0-0	for wood (Malbari timber)
Rs.	120-0-0	for iron sheets, handles, bars, etc.
Rs.	160-0-0	for colouring and painting.
Rs.	180-0-0	for lining cloth, leather, etc.
Rs.	36-0-0	for mirrors.
Rs.	80-0-0	paid to mochis for leather work.
Rs.	100-0-0	paid to the blacksmiths.
Rs.	52-0-0	paid to the labourers (coolies) who helped in various processes.
Rs.	150-0-0	paid to the carpenters.
Rs.	100-0-0	Karkhana rent per month.
Rs.	60-0-0	Electric and other sundry expenditure.
Rs.	1438-0-0	Total cost.

As he was to obtain Rs. 380 per body that is Rs. 1520 as sale proceeds, his net earning was Rs. 82 for that month.

This industry is of recent origin and has been only about 20 years old at Ahmedabad. All the four motor body builders at Ahmedabad are related to each other. Moreover, if orders are not received for new bodies they get some repair work also, and, there is no rate war among them. Because there is more demand for such motor bodies in Gujarat, one such karkhana is now opened at Nadiad, three or four at Baroda and 4 or 5 at Surat. The size of the industry is small in all, and in Gujarat, about 200 persons are engaged in this industry. However, it is likely to develop to a certain degree, and if proper steps are taken the demands of the omnibus-bodies of Gujarat will be easily met by the indigenous industry.

FURNITURE MAKING

According to the 1931 census 884 persons are working as cabinet workers, carriage painters and upholsterers in Gujarat. Out of which latter two numbered only 134 persons.

Thus furniture making has been a growing industry in Gujarat. Even in small towns the carpenters do get some orders for making chairs, tables, etc., but it does not form their main occupation. The leading centres of Gujarat in this connection are Ahmedabad, Baroda, Surat, Godhra, Sankheda, Bulsar and Patan.

Ahmedabad stands first as regards the size and the out put of this industry. There are about 22 large and 75 small concerns engaged in the city of Ahmedabad. The implements required by these carpenters are hardly worth a few hundreds and they make tables, cots, cup-boards, chairs, etc. One of the owners of the large concerns who employed about 30 to 33 persons when interviewed, related that his equipment was worth Rs. 3000, while the cost of its repairs and replacement came to Rs. 300 a year. He sold readymade articles worth Rs. 34,600 last year and he realised Rs. 300 by selling utilizable waste. The chief articles in his sales were cup-boards, tables, chairs, teapoys, cots, cradles, easy chairs, etc. The raw materials cost him Rs. 17,000 and the main items he required were iron nails and screws (Rs. 1500), polishing materials including cane, rexine, etc. (Rs. 3500), mirrors (Rs. 2000), and timber (Rs. 10000). His other charges for wages, rent, etc. were Rs. 14, 850*. On the whole he received Rs. 3050 per year. There are 22 such large concerns in Ahmedabad.

If the condition of the small concerns (in all 75 at Ahmedabad) are studied, where the owner is not a big capitalist, we find his income varying from Rs. 60 to 70 per month. One such Mistri when interviewed informed us that his implements consisted of 'rando', 'farsi', 'sāyadi', 'kātkhunā', 'drills', 'files', 'mārphā' (for rubbing), Ingal's Bhido (for pressing the planks), 'okari' (for polishing the wood), etc., etc., They were worth Rs. 500. Wear and tear as well as repairs of the equipment cost him Rs. 100 a year. As for the raw materials he required timber (of suitable size in cu. ft.), glass or sand paper, iron ware (nails, screws, handles, hinges (kal), chains ('sānkals'), (Mijagara), etc., etc., in all worth Rs. 7000. Wages (Rs. 1-12-0 per carpenter per day, he employed two carpenters, and one boy on Rs. 10 per month to handle 'rando', etc.), rent (Rs. 384), electricity (Rs. 30), and sundry charges (amount given for odd work, to polishers, etc.), amounted to Rs. 3000. His production from the above materials was of Rs. 12,000, last year. Hence on the whole he earned with the help of his partner Rs. 2,000. That is Rs. 1000/- each of them earned per year. In this, their capital, management, and, labour remuneration all were included.

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* Rs. 9000 wages, Rs. 4900 rent—being Rs. 350 per month, Rs. 500 electricity, Rs. 700 salaries to two Gumastas (clerks) (400+300), Rs. 100 sundries.

If, however, we try to study the economic conditions of an artisan who on his sole effort without employing any assistant makes the furniture it come to less than Rs. 50/- per month at Ahmedabad, less than Rs. 40/- at Surat; while the independent artisan at Olpad (in Surat District) earns hardly Rs. 30.

This branch of the carpenter's trade is, however, in a fairly good condition. The furniture makers everywhere asked for guidance about making more polished and attractive articles, and they also wanted to remain in touch with the markets and their requirements. It is, therefore necessary that modern journals on decorative and home furnishing trades, giving latest designs, patterns, etc., should be made available to them. In addition, if some Industrial Schools, having on their staff very skilled, expert and renowned hands, are opened at suitable centres, and, they maintain contact with the carpenters of the adjoining areas for giving expert guidence to them, they will be a double blessing. They will on the one hand produce better artisans, and on the other, improve the quality of the articles.

BAMBOO WORK — BASKET MAKING, ETC.

According to the Census of 1931 in all 10956 persons are engaged in this work throughout Gujarat; and the chief districts or divisions round which this industry is concentrated are as follows:—

Surat 1410, Navsari 1258, Kaira 1243, Mehsana 1097. The bamboo workers are scattered throughout Gujarat and they cater for the needs of their local as well as adjoining markets. Basket making is almost wholly a rural cottage industry. Further it is a family occupation and the workers mostly belong to the backward classes.

Some of the leading basket making centers of Gujarat are as under:—

	Centres		No. of persons employed
	Surat	...	125
	Bansda	...	50
	Rajpipla	...	40
and	Bulsar	...	30

On the northern side of the province few centres of importance are found, for, 'Vādis' or 'Mārwādis' (itinerant craftsmen) visit Palanpur, Cambay, Balasinor, and other localities and sell country huskers, mats, fans (vinzanās), etc. But in the South Gujarat, which is greatly favoured with green foliage, vegetables and fruits, more persons are found occupied in this industry. Basket makers are either Bhangis and Dheds in northern Gujarat while Vitoliyas, Kaliparaj and Vānsfodās in the southern Gujarat.

They make 'karandiyas' (for fruits), 'chhābadis', 'toplas', (baskets), huskers, 'pālā', 'vinzanā' (fans), etc., etc. 'Karandiyas' are more made on Surat side as they are required for the exports of fruit to Bombay by the district fruit growers. The Kaira, Cambay and Palanpur basket makers complain that Municipality has intrduced the iron baskets ('tagaras') for carrying the road metal, hence the demand for their baskets has now fallen. Moreover, the use of bamboo huskers for household purposes is fast declining, as people have taken the fancy for. the use of iron huskers. Under the circumstances very little can be done to revive the demand for these goods.

At times they request for facilities to obtain bamboos at cheaper rates. If they get it at reduced rate directly from the forest areas, they might be able to save some money. They earn Rs. 4/- to Rs. 4/8/- per month from this occupation. Mostly the females of the untouchables and some unemployed males engage themselves in making the bamboo wares.

The margin of profit is a bit high to the basket makers on the south Gujarat side, because, 'karandiyas' (that is baskets), for fruit, flower and vegetable exports, are more in demand in Surat and Navsari divisions. Not only the 'Vitoliyas', but the Vansfoda and Kaliparaj females (females of Konkanā, Gomtā, and Chodharā tribes) also occupy themselves in basket making* in southern Gujarat. They earn Rs. 5 to 5–8–0 per month.

Another important industry of these people in south Gujarat is of making 'chhats' and 'sādadis' (that is mats and mattresses) from 'khajuri' leaves for carrying cargoes in country crafts; and in addition some of these families make brooms for exporting them to Ahmedabad, Bombay and other places. A few hundred families engaged in mats and brooms making earn Rs. 4 to 4–8–0 per month. Mostly females occupy themselves in this industry; and, the size of most of the industries depends upon the cultivation of fruits, vegetables and flowers in this region. If the cultivation of fruits is encouraged, there will be more demand for their baskets. They also make baskets specially suited for the exports of eggs to the Bombay market. If, therefore, poultry farming is encouraged, more demand for these bamboo baskets will be created.

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* Vansfodas and Kaliparaj tribes are touchables while Vitoliyas are untouchables.

There is a large demand for fancy articles made of bamboos, but unless this knowledge of preparing hats, toys, balls, etc., is imparted to them, and technical and industrial schools are opened at suitable centres for that purpose, there is no possibility of creating a new demand for bamboo wares. Most of the basket makers (females of the backward communities) get themselves busy in agricultural occupations in seasons, for harvesting, winnowing, scattering*, etc., as the agricultural labourers.

Another similar industry which once gave employment to persons in thousands but has of late been waning, is that of Patrala and Padiya making often known as 'baj' making. Brahmin females used to occupy themselves in this industry and earn some side income for their families. However, at present only two important centres are there in Gujarat, *viz.* Umreth and Vapi; and by far the most important centre is Umreth.

At Umreth among 700 houses of 'Khedāval Brahmins' the females and children occupy themselves in 'patrala' making.

These people used to import 'khākhrā' leaves from Māl (in Thasra Taluka) by cart. But the Government later on began to lease the land for cotton growing instead of allowing it to remain pasture ('gauchar') land. Since 1910, therefore, these people obtain their requirements from Godhra side 80 per cent by cart and 20 per cent by railway.

Their demand for raw material is of Rs. 17,500/- and they make purchases of leaves in summer season. During the months of 'Vaishakh' and 'Jestha' the Brahmins go to fields to collect 'dittān' the roots of the crops grown, and use them to make hot water. While from the Harijan families employed in basket making wastage pieces ('sallis') they obtain and use them in making 'padiyas'. For patrala making they use 'rādā ni sali' which they get at 0-2-0 a ratal.

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* For 'Lanvā', 'Nindvā', 'Pārvā'.

From the waste grass fodder the 'sallis' are mostly made available to them by 'pāttidār' females. Even to-day about Rs. 50,000 worth 'patralas' are exported yearly to Bombay, Broach, Surat, Ahmedabad, and Nadiad.

No doubt a few families at stray centres in Gujarat are found engaged in patrala making but the only exporting centres are Umreth and Vapi. However, at Vapi about 60 families are engaged in making this 'baj' or patravali (leaf-plate) and their production is estimated at Rs. 2000/-. The net income of a family from this occupation at Umreth and Vapi comes to about Rs. 50/- per year.

As the industry is handicapped by the heavy railway freight, in the absence of a local market, these workers will get some relief by its reduction. For khakhra leaves the agriculturists are given orders in summer to fetch them from the forests and to that extent cart transport is also encouraged by the patrala makers.

But the demand of these leaf-plates is fast declining, as the caste dinners are no longer favoured by the educated families*. Whatever demand in a limited sense is still existing, it is only made during the marriage seasons.

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* The cost analysis of 'baj' making at Umreth is as follows:—

For a cart load of leaves	Rs. 9—0—0
Cartage	Rs. 5—0—0
For loading the cart and keeping it on the right track in forests, etc.	Rs. 2—0—0
Toll	Re. 1—0—0
	Rs. 17—0—0

From the cart load of leaves about 20,000 'bajs' can be prepared which would fetch 1-12-0 per thousand, that means Rs. 35-0-0. But to make the 'bajs' 'salli' (baru ni chhoi) which is available at 0-2-0 per ratal is required. From 2 ratal 'sallis' 1000 bajs can be prepared, therefore, cost of 'salli' comes to Rs. 2-8-0. One family of six (including 3 or 4 children) can prepare less than 2000 bajs per day. Hence something like 13 days are taken to prepare 20,000 bajs, and it leaves Rs. 15 to the family by way of remuneration. However, no family has full time occupation throughout the year in this industry. Ultimately they adjust their supplies to the demands.

CHAPTER IX

METAL WORK

THE census figures show us that the total number of workers in metals is 15,385 in Gujarat. This number can be classified as under :—

Blacksmiths	12,219
Workers in brass, copper and bell metal ...	2,723
Workers in other metals	212
Workers in smelting, forging and rolling of iron and other metals	231

We find the largest number of blacksmiths in Mehsana Division, 2460; in Ahmedabad District the number is 1784, in Kaira District 1121, in Baroda Division 1057, in Palanpur State 952, in Surat District 719, in Idar 601 and in Panch Mahals 593.

Generally the blacksmiths are found scattered all over Gujarat, and at least every big village has one blacksmith to cater for its local requirements, and also, of the adjoining small villages. Theirs is mostly a cottage industry. In the past they had a conspicuous position in the rural economy. When the factory goods were not available, a rural blacksmith with his iron ingots, rails, wires, old files and coal used to make agricultural implements, like pickaxe, shovel, axe 'dātardu' (grass cutter), 'dhāriyu' (wood taper), etc., etc. He also used to make cart axles, iron bands for cart wheels and the tools required by artisans in other crafts, e.g., saw, scissors, knives, etc., etc. In addition all the iron wares for building construction like iron frames ('Jālis'), hinges ('nakuchā'), Chains ('Sānkals'), as well as household requirements like nut crackers, locks,

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[*] "Iron of good quality used to be made at Purdvania near Ratanpur (Rajpipla State). In 1855, though manufacture had for many years been given up, Nandod had still a good name for its knives and swords." *Vide*, Gazetteer of the Bombay Presidency Vol. VI, page 97.

sieve, huskers, 'urani' (iron net for holding fire in the hukkā) and kitchen requirements like 'sānsi' (iron holder), 'kadchhi', tavetho, were made by him.

But the advent of machine goods has deprived him of this demand for his products, and since the last World War there has been a rapid decline in the demand for household requirements, as well as in the demand for agricultural implements. Factory goods, being cheap, began to find preference even in villages; and, they undermined to a considerable extent the position of the blacksmiths. Hence the blacksmiths now mainly engage themselves in repair work and make some agricultural implements, like cart axles, iron bands, etc. If in some centres they make knives, locks, etc., their demand is fast declining; so on the whole, the rural blacksmith's position is becoming precarious. The decline in the bullock transport, production of household requirements by indigenous factories, and import of foreign implements are the main causes leading to this result. At most of the centres if their elders used to pay annas 8 per day to a worker before the last World War, now they hardly pay annas 4. As a rule, they are not able to employ a labourer as they do not get enough work. In the midst of scattered villages the blacksmiths by mutual understanding attach themselves to groups of cultivators, cater for their requirements all the year round, and earn 3 or 4 maunds of grain by way of remuneration. They even try to supplement their income by cultivating a small piece of land, or by maintaining some cattle. Consequently many of them have already left their hereditary calling.*

But it must be remembered that if the old demand for the black-smith's products is falling, new demands for his services are arising from public requirements of cutlery, iron furniture, iron containers, trunks, safes, cupboards, tins, buckets, etc., etc. To meet this demand, however, the rural blacksmith is hardly equipped with adequate training. As for the cottage products of this indutry the prevaling conditions are as follows :—

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* At Borsad, Nadiad, Halol, etc., blacksmiths are found working as goldsmiths (they are known as Luhar-Sonis). At Lunawada, Himatnagar, Patan and Santrampur blacksmiths make silver ornaments, while at Halol majority of blacksmiths are engaged in carpentry at present.

MANUFACTURE OF RAZORS

Vadnagar (Baroda) and Umreth (Kaira) are the famous razors manufacturing centres of Gujarat. In the past they claim to have met all the needs of Gujarat proper as well as of peninsular Gujarat. Upto the last World War they were able to hold their own, but thereafter gradually they lost their markets as the foreign machine made better quality attractive razors began to be imported in large quantities in India. Otherwise even the barbers from Ratlam, Indore, etc. (of far distant places) used to purchase these Gujarat razors. There are at present four razor manufacturers at Umreth, and their total annual output is of Rs. 1200. They also manufacture scissors. They require old iron files as the raw material, and, they purchase them from Nadiad and Ahmedabad ; while Vadnagar artisans purchase them mostly from Baroda. Vadnagar's total output of scissors and rezors is of Rs. 2000.

It is very difficult to ascertain the profit from the razor making for no one at these centres at present concentrates wholly on razor making.

Mr. Chimanlal Shankerlal Mathur (Luhar) who was interviewed for this purpose at Umreth informed us that he employs one assistant whom he pays Rs. 15/- per month. In 1937–38 he purchased files worth Rs. 18/- while he incurred expenditure of Rs. 60/- on coal and chemicals. In addition, he paid annual rent of Rs. 40/-. The value of razors and scissors he turned out was Rs. 480/-. He thus earned Rs. 15/- per month from razors and scissors making, while, about Rs. 8 to 10 he used to earn per month from the repairs of agricultural implements, etc. He further stated that upto 1937 he used to sell 1000 razors (that is, 50 kodis) per year, but as the barbers' services began to be affected, and, the educated began to use safety razors, blades, etc., the trade in Umreth as well as Vadnagar razors declined.

Their crude razors with round wooden handles are sold at Rs. 12 per dozen, and, they are now favoured only by the village barbers.

These artisans are, therefore, eager to get familiar with the technique of production of machinery, and, they demand that, they should be supplied with the necessary machinery on easy terms. They want some State effort in this direction. Unless they can make the razors which suit the modern taste, as regards their smoothness, polish and attractive shape, there is no possibility to revive this industry which is fast narrowing its size because of the rapid fall in its demand.

MANUFACTURE OF NUTCRACKERS AND KNIVES

Patan (Baroda) and Olpad (Surat District) are the welknown centres of Gujarat for Nutcrackers making, while, Amod (Broach District) and Lunawada for their knives. The artisans of Olpad also engage themselves in making knives. 30 years ago about 25 blacksmiths concentrated on the making of nutcrackers at Patan, but at present only 3 blacksmiths are found in this industry, while others have taken to silver ornaments. 15 years ago 7 blacksmiths were making nutcrackers at Olpad, but today only one is engaged in this industry. While at Amod nine artisans (blacksmiths) are making knives, but they do not find adequate demand for their products, hence knives making has become a subsidiary occupation to them and mostly they are found engaged in repair work.

The implements of the nutcracker maker are 'Dhaman', 'Eran', 'Hathodi', 'Sansi', 'Shigro', 'Chhini', 'Ghan', etc. Mr. Motilal Sukhram Panchal who was interviewed by us at Patan informed us that his implements were worth Rs. 125/-.

As for the raw materials he required 'gajvel' (iron steel), 'Kanas' (file), iron (for preparing handles) and in addition coal.

He required 4 maunds 'Gajvel'—Rs. 20 worth (at Rs. 5/- per maund); 5 maunds iron—Rs. 20 worth (at Rs. 4/- per maund); and Rs. 50 worth coal per year (at Re. 1-4-0 per maund).

He made nutcrackers of different shapes :—'Katārvāli' (swordshaped), popatiā ghātvāli, (parrot-shaped), 'pittal ni kamān vāli' (nutcrackers with brass rim), etc., etc. Two artisans could make 8 to 10 nutcrackers in a day by working for 8 to 9 hours, which means that two artisans could work upon 1¼ seer gajvel and iron in a day—(a nutcracker usually being ⅛ seer in weight).

From the above raw material he made 960 nutcrackers of the value of Rs. 480 with the help of one partner and each of them obtained Rs. 195 at the end of the year. This amounts to Rs. 15 to Rs. 16 per month. Formerly the same quantity of output would have brought Rs. 20 to 22 per month to each of them. Moreover, he further stated that in spare time they had made 'Chhaddās' (footwear), and, 'Kānkans' (handwear) for the Shepherd (Bharvad) females, and had obtained about Rs. 100 from such stray work for their labour. But they had to pay the same amount to the nutcracker sharpener (who charged 0-1-0 per nutcracker that is in all Rs. 60), and, for the rent of the shop and for other miscellaneous purposes.

Before the last World War they used to purchase double the quantity of raw materials and concentrated wholly on nutcracker making. They obtained better price for the nutcrackers. The nutcracker which used to fetch them annas 12 formerly, fetches annas 8 in the market at present.

The season for the sale of nutcrackers is the marriage season ('Lagna Sarā). This handicraft received setback in the demand of its product with the imports of cheap and well-polished articles from Japan and Germany. Another source of competition was the better quality Jamnagar, Limdi, Anjar (Cutch) and Aligarh nutcrackers. In these centres machinery has been introduced for certain processes.

The nutcracker makers of Olpad and Patan, therefore, require some technical guidance to improve the finish and shape of their articles at a small cost. They also suggested that the Government should depute some persons to study very carefully the technique of production followed in Japan and Germany and train them up by making available such expert guidance. In addition, in order to create a larger market for indigenous nutcrackers and knives they urged for protection against foreign imports.

IRON GALLERY FRAMES

At Lunawada there are about 35 shops of blacksmiths, 10 of which have concentrated on iron frames and 'Tāvdās' (iron buckets-frying pans) making. Iron frames (jālis) are also made at a few other centres of Gujarat, like Ahmedabad, Rajpipla, Kapadvanj, etc. But, Lunawada's blacksmiths could establish their reputation because of the orders from Poona of Mr. Abbasbhai Kadarbhai, a former resident of Lunawada. He used to send 150 to 200 maunds of iron to Lunawada for manufacturing frames (jālis) to be used for the verandāhs, lobbies, windows, etc. However, since 1935-36 he has stopped sending order to Lunawada artisans, which means, either iron frames are made in Poona, or Mr. Abbasbhai has made some other arrangements.

With their simple implements, 'Shighro', 'files', twist drills etc., etc., these artisans at Lunawada can manufacture one maund frames ('three āoni choras sali') per day. Iron costs Rs. 4–8–0 per maund, while sales returns of their manufacture varies from Rs. 5–8–0 to Rs. 6–0–0 per maund, according to the demand. Therefore, the artisan engaged in iron frames making earns Re. 1 to 1–4–0 per day for his labour. He obtained Rs. 10 per maund of ready made iron frame which left Rs. 5 as his remuneration.

Today, in season (winter and summer) orders for 5 to 6 maunds of iron frames per month are received by each of the artisans at Lunawada. In rainy season (that is in slack season) these orders are reduced, and each of them hardly receives the orders for 2 to 3 maunds of iron frames. Hence side by side with the frames making some of them make 'Tāvdās'—iron buckets (frying pans). From one maund of iron after two days' labour, one big 'Tāvdā' can be made which fetches Rs. 6–8–0 in the market. From 'Tāvdà' (iron bucket) making the artisan obtains Re. 0-14-0 to Re. 1–0–0 as remuneration for his labour. As the caste dinners are fast going out of vogue, the demand for these frying pans is rapidly declining and their sales have been greatly reduced. The artisan interviewed by us had made two frying pans and was awaiting the customer for their disposal before manufacturing new ones. Because of the inadequate demand of the above articles some of these artisans have now taken to knives-making. But the demand for knives is also affected with the inroads of machine products. Hardly Rs. 150/- worth penknives are manufactured at present at Lunawada per year; and the raw material required for knives-making is hardly worth Rs. 20/- at this centre.

As the sale of their knives is affected because of the availability of polished, attractive, cheap factory knives in the markets, they urge that at least polishing machinery (which will hardly cost Rs. 75), and 2 Horse Power Motor, (estimated to cost Rs. 350) should be installed at Lunawada by the State for their use at reasonable charges, and that some guidance in the beginnig for its handling should be given to them.

Two artisans were engaged in making guns at Lunawada. But after the last World War they hardly obtain repair work in this connection.

Pethapur (Mahi Kantha Agency), Rajpipla and Lunawada are some of the centres which were well reputed for guns, spears and swords manufacturing in Gujarat. But after 1857 (with the Arms Act coming into force in India) these centres have lost their importance as manufacturing centers and they get mostly guns repair work. At present, therefore, no guns manufacturing centre worth mentioning is found in Gujarat.

Another cottage industry which is now on the verge of extinction, or which is practically lost by the blacksmiths of Gujarat is that of making brass ornaments.

BRASS ORNAMENTS MAKING

'Pittaliās' of Gujarat (mostly the blacksmiths) were having their hey days before the last World War. About 5 blacksmiths at Lunawada, 4 at Santrampur, 12 at Dahod (6 shops), 30 at Zalod† and about two dozen more in different parts of Panch Mahals were busy making brass bangles for Bhil females.

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* About 15 shops at Lunawada have now concentrated on preparing (and mostly repairing) agricultural implements, and have engaged themselves in meeting the requirements of the agriculturists of the adjoining villages. 5 shops prepare wooden articles like cots, cradles, wooden bangles, etc.. while the remaining 5 are preparing silver ornaments. Hardly there are two artisans per shop, and, the earning per shop is not more than Rs. 40/- per month.

† "There are about 30 people who make brass ornaments for the Bhils." *Vide* Report on Art Crafts of the Bombay Presidency by G. P. Fernandes, page 78.

As for handwear they prepared 'Gajarās', 'Lodiyās', 'Kānkans', etc., and for the footwear they prepared 'kadis', Pāvadiyās,* etc. As there was good demand for these ornaments at one time each of the above artisans used to employ at his shop 5 or 6 workers to help him in various processes. Hence this industry used to employ about 300–350 persons.

In addition to the wearing of lac, cocoanut, and wooden bangles ('sisam nā baloyās'), there was a fashion amongst the Bhil and other Rani-paraj tribes to put on brass ornaments. Raw materials required for preparing these ornaments are scrap brass, wax, and salt; and the main implements clay or mud dies and a 'Bhathi' (furnace). Mud dies are required more in number and it is a very laborious task to make such dies; hence the artisans used to keep themselves busy making such clay (or mud) dies throughout the rainy season, which is generally a slack season for the sale of bangles. During the winter and summer seasons they used to make footwears, and handwears. A big 'pittaliā' who used to employ six persons to help him used to earn Rs. 200/– per month.‡

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8 Gajaras can be prepared from one seer brass					S. P.
6 to 8 Kankans	do	do	do	do	12 per rupee
7 Lodiyas	do	do	do	do	Re. 0-1-3 each
2 Pāvadiyās	do	do	do	do	Re. 0-5-0 each
while 'Kadis' usually weigh 15 tolas each					Re. 0-2-9 each

‡ Monthly requirements of a big 'pittaliā':

2 Bhathis a day of 3 maunds each, ∴ 52 Bhathis per month (excluding 'anojābs' holidays) 156 maunds x 13 = Rs. 2028
Fuel (cow dung cakes 2000 per bhathi. 600–700 per rupee) = Rs. 200
Wax ($\frac{3}{4}$ maund, Rs. 20 per maund) ... ... = Rs. 15
Salt (2 Seers per bhathi at Re. 1–4–0 per maund)... = Rs. 3
Labour charges 6 workers each Rs. 12 per month ... = Rs. 72
Rs. 2318

Sale proceeds therefore of 136½ maunds (as per maund of scraps 25 Seers pure brass remains) at one rupee 12 'Kānkans' of 2 Seers weight ... ... Rs. 2730

Rs. 2730 Sale proceeds
– 2318 Raw materials and labour charges
– 112 Sundry expenditure, Rent etc.
Rs. 300 Profit per month. But he could earn this much for eight months ; for 4 months he was busy making clay dies.

Mr. Nathaji Parshotamji Panchal when interviewed at Dahod related that in 1920 he used to manufacture footwears and handwears in six Bhathis of 2 maunds each in a month. His expenditure was Rs. 216 for scrap brass, Rs. 18 fuel (cow dung cakes), Re. 0-6-0 salt, Rs. 60-0-0 labour charges, in all, Rs. 306-6-0. In melting the scrap there occurred 5 lbs loss in weight. He, therefore, realised 15¾ maunds of pure brass, from which if the only product 'kānkan' be considered, he made 5040 kānkans and sold them at 12 kānkans per rupee. He thus realised Rs. 420 as the sale proceeds. But his average income was Rs. 75 per month, as he had to spend four months in mud dies making.

It was in 1920 that a Bhil named Guru Govind who was held in high esteem by the Bhil community preached against the use of brass ornaments. These ornaments contained clay inside. Hence the moment upper brass material gave way by ware and tare, clay used to come out from the bangles creating big hollows inside in which it is reported that at times insects were found. Social workers of Dahod Bhil Seva Mandal also supported this move against the use of brass ornaments. Hence, due to their active propaganda the use of brass ornaments fast declined. As a result 'pittal' bangles making has practically vanished from all parts of Gujarat, save at Dahod, where only two aged 'pittaliās' prepare one 'bhathi' each per day. Being aged they persist in this old craft, and the same holds good about the two aged 'pittaliās' now at Zalod.

'KATHIR' BANGLES MAKING

With the rapid decline in the use of brass ornaments all the blacksmiths engaged in the industry—(about 300-350) became unemployed, and they began to take to other avenues of life whenever possible. But a new substitute was introduced at Dahod by the Bohra merchants. Bohras of Dahod began to make bangles from 'Kathir' (Lead), and supplied them to the 'Bhil' females. At the start (by about 1922–23), a few artisans also started lead bangles making at Lunawada, but now it is given up; while two goldsmiths and one blacksmith even today make lead bangles at Garbādā in Panch Mahals. These artisans, engaged in lead bangles making, are known as 'Kathiriās' (lead-bangles makers) in Gujarat. There are 11 such shops of Kathirias at Kathiria Bazar, Dāhod.

Their implements are simple: some needles, 'pakkad' (spincer), etc., and in addition they import Vānswādā stones which are very soft and can be easily carved. They are available at Rs. 2/- per maund, and, from these stones dies of suitable sizes and required shapes are made by the 'Kathiriās'. In addition, they also keep some iron dies, but, on the whole, their implements are hardly worth Rs. 10/-.

It is very easy to melt Kathir, and pour the hot, liquid lead into the die to obtain the required shape. Hence these people hardly employ any outside person to help them. Mostly the merchants themselves import lead, prepare the ornaments, and, sell them to the 'Raniparaj' and 'Bhil' females.

Another advantage in making lead bangles lies in their varieties, that is, they have been able to introduce more shapes and designs in the 'Kathir' bangles. They now prepare for handwear 'Bhoriyā', 'Gujari', 'Gol', 'Karvāni', 'Chudi' while for the footwear 'Kadlā', 'Langar' 'Gol', etc., etc.

In addition, these 'Kathir' merchants are able to re-purchase old worn out, or out of fashion lead ornaments; and instead of importing new lead, they melt old ornaments, and make new bangles of required shapes for sale. They purchase old ornaments from 'Bhil' and 'Raniparaj' females at a lower rate.*

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* The members of the Bhil Seva Mandal, as well as, other Social Workers of Panch Mahals are against the use of lead bangles by Bhil females. Because lead immediately renders black any article to which it is rubbed, they are, therefore, afraid that constant use of these ornaments by the 'Raniparaj' and 'Bhil' females might render their skin even darker.

More demand for 'Kathir' bangles is in 'lagna saras' (marriage season) which means in the months of 'Posh', 'Māha' and 'Vaisākh' and usually they import their raw material (which is lead) during these months from Bombay.

Mr. Tayaballi Musabhai who was interviewed by us in this connection informed us that his annual requirements of lead were of 30 maunds of 40 seers each. (Lead was available at Bombay at Rs. 39/- per maund of 28 lbs, which meant at about Rs. 60/- per maund of 40 sheers). He required about 20 maunds in season (winter and summer) and 10 maunds out of season (in monsoon). Half his requirements he could get from the repurchase of old ornaments at Rs. 45/- per maund, he, therefore, imported only half the quantity. Raw material (lead), therefore, cost him Rs. 1575/-. In addition, he paid Rs. 60/- shop rent, about Rs. 10/- for fuel, etc., etc. While the sale proceeds* realised were Rs. 1970/-. He earned Rs. 25/- per month.

'The margin of profit' he reported to us, 'was more before 1926'. After 1926 the demand for 'Kathir' bangles is on the waning side. As a result 'Kathir' bangles making has died out at Lunawada, while at Mandvi only footwear 'Kadlis' are made, that too on a very small scale. Dahod merchants also report that their markets are being gradually curtailed.

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* From Rs. 2-14-0 worth ornaments weighing 1¾ lbs, which we purchased from him he earned Re. 0-6-3 as labour charges. Our purchases were :—

One 'Pàtdi'	...	0-0-9	each taking less than half an hour
One 'Katariya'	...	0-0-6	do do do do do do
One 'Gujari'	...	0-0-9	do do do do do do
One 'Bhoriya'	...	0-0-6	do do do do do do
One 'Jhelo'	...	0-0-9	do do do do do do
Two 'Chudis'	...	0-3-0	each taking half an hour to prepare
	Total	0-6-3	labour charges he obtained, while lead cost him Rs. 2-7-0.

From 1926 onwards aluminium ornaments, exactly the proto types of the lead varieties, have begun to be imported from Benares by the merchants of Dahod, Santrampur, Zalod, etc. They are very light and cheap and hence they began to find favour with the 'Raniparaj' and 'Bhil' females. The 'Chuddis', 'Kaimāndis', 'Gujari'' of alluminium are exactly of the same shape and design as in the case of the lead ornaments.

As these imported goods began to find more favour with the backward class females on this side of Gujarat, Bohras of Dahod often tried to manufacture them at Dahod; but all their experiments have failed as alluminium could not be properly moulded by them.

"If alluminium bangles are broken the 'Bhil' females do not obtain as much as they do from lead bangles. So put a stop to their imports at Dahod. If not, teach us how to make the alluminium bangles." This is their general cry or demand. About Rs. 10,000/- worth alluminium ornaments are annually imported in Panch Mahals, and hence if no steps to protect this industry are taken in time, there is every likelihood that 'Kathir' bangles making will decline without substituting any new local industry in its place. Bangles making as such even today maintains a fairly large number of artisans in Gujarat, and hence it deserves a special study. Not only the above indigenous Indian substitute competes with the Kathir, lac and brass bangles of Gujarat, but foreign imports of rubber bangles, and imitation ivory bangles also hard hit the out put of real ivory products.

IRON MANUFACTURES

Leaving aside the cottage crafts which are in a state of decay, we would now survey the conditions (1) of those iron industries) which came into existence very recently, and, also (2) of those that have expanded to a considerable extent in very recent times.

In Gujarat there are now in existence 5 Engineering Workshops[*] employing 225 persons doing general repairs and side by side producing some articles from scrap and cast iron, hard coke, gun metal, etc. in their foundaries. One such workshop produces mainly bolts, the other two crude oil engines, sugar cane crushers, electric pumping sets, etc., and the rest shafting pulley, columns, brackets, etc., required for structural purposes in textile mills.

In addition there are 14 Mechanical Workshops, better known as Iron and Brass Foundries, employing about 400 persons. These workshops are also doing the repair work and manufacture articles by casting the iron and brass metals. There is still very good scope for these concerns to make mill machinery parts most of which are still imported from foreign countries. But before these concerns[†] can safely embark upon such schemes a sympathetic Government policy is required, and, adequate protection against foreign imports will have to be guaranteed. At present most of the Spinning Machinery parts are imported from outside. To the mill machinery parts already manufactured in Gujarat, we have referred to in the following pages; and, for those which are imported from the foreign countries it is necessary to point out at this stage that they are marking time for the introduction of their establishments in the province.

Place	Name	Class or description of Industry	Average number of workers employed
1 Baroda	The Baroda Bolt and Engineering Works	Engineering Work	15-18
2 Surat	National Motor and Engineering Works	Manufacture of crude oil and engines and general repairs	23
3 do	Surat Engineering Works	do do	25
4 Ahmedabad	Imperial Iron Works	Foundry and Workshop	46
5 do	Ahmedabad Victoria Iron Works	do do	88

[†] See footnote on the opposite page.

IRON TRUNKS MANUFACTURING

It is already acknowledged on all hands, that railways developed the markets for the factory goods. They opened up the interior markets and incidentally put the village into direct contact with the town. They thus fostered the travelling habits nay, even necessitated the travels, by making the labour more mobile. With the movement of population from one part of the country to the other, wooden boxes were found totally inconvenient for carrying the goods, and hence, more demand arose for steel and iron trunks. In order to meet these demands we find in different parts of Gujarat trunk manufacturing concerns have been established in comparatively recent times.

† Place	Name	Class or description of industry	Average number of workers employed
1 Petlad	Patel Chaturbhai Bapuji Iron Brass Factory	Engineering Works	15
2 do	Lowar Fulchand Narandas Iron Brass Factory	do do	15
3 Ahmedabad	Pioneer Engineering Works	Brass and Iron Foundry	25
4 do	Panchal Ishwardas Harjiwandas Iron and Brass Foundry	do do	46
5 do	Mistri Mangaldas Jethabhai Iron and Brass Factory	do do	50
6 do	do do do	do do	88
7 do	Omkar Iron & Brass Foundry	Foundry and Workshop	19
8 do	Ram Vijaya Iron and Brass Factory		
9 do	Vishnu Vijaya Iron and Brass Factory		
10 do	Laxmi Vijaya Iron and Brass Factory		
11 do	Panchal Trikamlal Maganlal Iron and Brass Factory		
12 do	Mistri Ambalal Jethalal Iron and Brass Factory		
13 do	Panchal Rughnath Sankalchand Iron & Brass Factory		
14 do	Hasanali Fujalali Iron and Brass Factory		

The following are the outstanding trunks manufacturing centres of Gujarat: Ahmedabad (18 concerns), Surat (6 concerns), Baroda (5 concerns), Broach (4 concerns), Godhra (2 concerns), Nadiad (1 concern), Zalod (1 concern), Bulsar (1 concern), Patan (1 concern), and Mehsana (1 concern).

Except at Ahmedabad, Surat and Baroda these concerns also manufacture iron safes, 'tubs', 'pips' (iron containers), cupboards, etc. Hence to study the existing conditions of trunk manufacturing in its proper perspective, Ahmedabad and Surat are the proper centres; of these, Ahmedabad happens to be the leading centere in Gujarat.

Out of the 18 concerns at Ahmedabad five are big while others are comparatively small. The proprietor of one of the big five when interviewed informed us that he required 300 tons iron sheets ('Khilasari'—'Tar' included) which meant Rs. 40,000/- worth of raw material. In addition 'Beltel' and 'safedo' worth Rs. 2000/- and colour cost him Rs. 2000/-. His equipment was worth 3000/- and electric charges, wear and tear of equipment, etc., came to Rs. 500/-. He employed on an average 20 persons—7 to 8 artisans and 10 to 12 labourers. In addition he engaged 3 clerks. He had paid by way of salaries and wages, to his employees including all stray piece rate workers Rs. 16,000/-. He paid Rs. 1500 (per year) shop rent, Rs. 780 'karkhana' rent, and in addition he incurred sundry expenditure including payment of income tax, fuel, cost, etc., etc.

In his equipment he could manufacture 150 trunks per day worth Rs. 300/-. His sale proceeds for the year 1937–38 were Rs. 40,000 while he had in stock raw materials and manufactured goods worth Rs. 30,000/-. He, therefore, earned Rs. 7,000/- on his investments which meant Rs. 600/- per month.

20 years ago his income was Rs. 1000 per month, he used to employ 30–35 labourers (instead of 20 as at present),

while his office rent was only Rs. 800 (instead of Rs. 1500 per year as at present). This was so, because, this industry was still gaining footing at Ahmedabad, hence, more margin of profit, while, later on more trunk manufacturing concerns were started in Ahmedabad and also in other parts of Gujarat and Kathiawar.

Another big Karkhandar also endorsed this view by informing us that 15 years ago he used to earn 12 to 15 per cent on his investments while at present he hardly earns 7 per cent. Moreover, before 15 years, there were only five trunk manufacturing concerns in Ahmedabad, while at present, they are 18. Hence to a certain extent rate war had set in.* As trunk manufacturing was started in other centres of Gujarat and Kathiawar, to a certain extent there was curtailment in the orders received by them from those parts. Borsad, Nadiad, Anand, Surat, Rajkot and Verawal markets were practically lost in this way, and, every year Ahmedabad was finding about Rs. 10,000 to 12,000 worth reduction in the orders. It is, however, gratifying to note that this is mostly due to the establishments of trunks manufacturing concerns in other parts of Gujarat and Kathiawar. The industry has thus shown considerable expansion in its size.

Brisk season for the sale of trunks is the marriage season (Lagna Sarā†). These manufacturers, themselves being the dealers, manufacture almost ¾th of their annual productions during the rainy season for it being a slack season for sale, it is convenient for them to supervise the manufacturing work if and when necessary.

Another big manufacturer when interviewed informed us that his investments were running to Rs. 90,000 to 1,00,000 in the industry. As small manufacturers used to purchase iron from him he stocked more raw materials. On the whole he earned 7 per cent profit on the investments. About 15 years ago the margin was much and he used to earn 15 per cent on the sale proceeds.*

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* 15 years ago iron trunks usually were sold on more than 0-4-0 margin of profit, (actual profit to the trunk dealer—net profit) "But now 30 guage iron trunks left 0-2-0 profit, 27 guage 0-2-3, 24 guage 0-2-6" he said.

† Chaitar-Vaisākh, and Posh-Maha.

However, it is interesting to note that permanent labourers as such who are paid monthly wages, are very few in these karkhanas. Except the clerks in the Office or the 'Mukadam' in the kārkhānā who are obviously paid monthly wages, almost all other artisans and labourers are on daily wages, and they are paid on piece-rate.

Usually the labourers form their parties of 7, 8, or 10 and take up on lot the work for colouring, applying hinges, hooks, etc., or for preparing the trunk models of a particular size, etc., etc. No child labour is employed in these kārkhānās at present, for the Factory Act is now in operation; and the adults employed obtained on piece-rate on an average Rs. 20 to 40 per month. He complained about (1) the increase in rent, (2) necessity of having trunk manufacturers' Association at Ahmedabad and (3) he viewed with grave concern the growth of factories producing trunks at other centres.

In his estimate about Rs. 1,50,000 worth trunks are manufactured every year at Ahmedabad, and the industry required iron worth Rs. 80,000/- (Rs. 60,000 Tata's, and Rs. 20,000 imported from England). These are the authentic statistics, for, in their sale proceeds these big concerns also include the sale of iron sheets, wire (Khilasari) etc., to the smaller concerns who do not import these materials directly from outside, and mostly make purchases from these big five concerns of Ahmedabad.

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* For the year 1937-38 he required approximately Rs. 40,000 Tata iron; Rs. 12,000 English iron; he paid Rs. 544 for railway freight, Municipal tax, etc.; Rs. 4,500 for colours (Beltel—Safedo Rs. 1500, dry colours Rs. 3000), Rs. 600 ware and tare of machinery tools, etc., on his equipment worth Rs. 6000/-; Rs. 21,000 wages; Rs. 180 electric charges; Rs. 2880 Factory and Office rent; Rs. 305-13 0 Municipal tax, etc,; Rs. 500 sundries, fuel, carriage, etc. His sale proceeds for the year were Rs. 53,000/- while raw materials and manufactured goods Rs. 34,500 worth were in his stock.

On the whole, this industry maintains about 800 to 900 persons in Gujarat; and at present even if the margin of profit has gone down, it is sufficiently high to induce others to take to this industry.

IRON SAFES AND CUPBOARDS MANUFACTURING

About 20 years ago, there were only 2 safe manufacturers at Ahmedabad. But later on due to the increasing demands for safes, one after another new concerns came into existence, and, at present there are in all 13 such concerns at this centre.

In addition, we find safes and cupboard manufacturing concerns 4 at Surat, 1 at Nadiad, 1 at Bulsar, 1 at Patan, 1 at Broach, 2 at Godhra, 1 at Devagad Bariya, 3 at Balasinor, 1 at Thasra, 1 at Dakor and 1 at Zalod. However, the Zalod and Godhra artisans occupy themselves in trunks manufacturing, while the Nadiad artisans in addition prepare locks, keys, cash boxes, etc. Thus the safe manufacturing has spread itself to a limited extent in different parts of Gujarat in comparatively recent times.

One of the safe manufacturers when interviewed at Ahmedabad informed us that his raw material was mainly Tata iron which he required Rs. 3000 to 40000 worth every year. His equipment was hardly worth Rs. 200. He employed 5 persons, 2 artisans on Rs. 2/- per day and 3 labourers on Re. 0-12-0 per day.

For manufacturing a safe 24" x 24" x 30" weighing 15 maunds, 1 labourer and 1 artisan took 15 days. The cost analysis of the safe worked as follows:—

	Rs. as. p.	
Iron 15 maunds	39—6—0	(Rs.2-10-0 per maund for producing cheap inferior quality safe)
Colour, its application, etc.	7-14—0	
Polishing, etc.	1—4—0	
Labour charges for 15 days	41—4—0	
	89-12—0	

This safe would fetch him Rs. 105/- so he got Rs. 15/- per safe. As he employed three labourers and two artisans he could manufacture 6 safes per month. He required one artisan less for he himself was an expert artisan and worked with the labourer. He, therefore, saved Rs. 60 per month from the labour charges but as he had to pay Rs. 600 annual rent and he incurred Rs. 80 sundry expenditure for the upkeep of the equipment, furnace, tools, electricity, etc., his actual income was Rs. 90 per month.

Another safe manufacturer narrated to us that the brisk season for the sales of the safes was October to March. Formerly traders from Marwad, Delhi, Agra, used to come to Ahmedabad and purchased the stock from him. But now such visits of outside purchasers are rare.

His equipment was hardly worth Rs. 500 and it consisted of drill machines 'lāgiyā', 'hathodi', files, electric motor (for preparing holes) etc., etc. He manufactured better quality 5 safes per month. His cost analysis of the safes was as follows:—

Rs. as. p.	
45—0—0	15 maunds iron at Rs. 3 per maund.
56—4—0	Labour chages (to the artisan at Rs. 2-8-0 per day Rs. 30 and to the labourer at Rs. 1-4-0 per day Rs. 18-12-0)
10—0—0	Colour, its applications, etc.
1—8—0	Polishing charges.

112-12—0 was his total expenditure and the same safe was sold at Rs. 150. He thus earned Rs. 37 per safe. His monthly gross income was Rs. 185, but when rent, electricity, ware and tare of machinery, etc., were deducted the net income to him was Rs. 100 per month.

IRON CUPBOARD MANUFACTURING

One of the manufacturers who happened to solely concentrate on cupboard manufacturing at Ahmedabad, when interviewed, informed us that he purchased in lot raw materials from the local market, stocked them at his 'kārkhānā' and then prepared cupboards on order. He usually purchased the stock worth Rs. 5000 to 6000 at a time. His equipment consisted of files, axe ('hathodi'), drill ('pānā',) lathe, cutter, electric motor, in all worth Rs. 500. He required wrought iron which was available at Rs. 3-11-0 to Rs. 3-12-0 per maund, plus rivetting material and mirrors. He employed workers on daily wages and paid them per month. In making 6ft x 3ft x 20" cupboard Rs. 35 for iron, Rs. 20 for labour (one labourer and one artisan), Rs. 5 for colour, polish, rivetting, fuel, etc. were to be spent. In all, therefore, Rs. 60 was the cost of the cupboard and it was sold at Rs. 75 to 80 at Ahmedabad, while the same was sold at Rs. 65 at Godhra. Hence because of the advantage of cheap labour at Godhra, rate-war was existing, and, he urged for (1) creating an Association to safeguard the interests of this industry, and (2) fixing the minimum price. He made 6 cupboards per month and earned about Rs. 90 per month. It is to be noted in this connection that he himself also worked with the artisans in the kārkhānā for some processes as an expert hand.

It will be interesting to note here that the safe and cupboard manufacturers of the centres other than Ahmedabad, Surat, and Godhra, concentrate more on cupboards. Labour is cheaper in these centres but as they have to import raw materials to a certain extent the advantage of cheap labour is mitigated at these centres.

MANUFACTURE OF PARTS OF MILL MACHINERY*

This industry is of comparatively recent origin and as such has concentrated more at Ahmedabad, it being the textile centre of Gujarat. About 75 karkhanas are located in Ahmedabad employing in all about 800 persons. In addition, there are 2 such concerns at Nadiad, 5 at Surat and 3 at Bulsar. These 'kārkhānās' manufacture twist wheels, pinions, gearing wheels, brackets, and other spinning and weaving parts. The cost of the equipment required by them varies from Rs. 4000 to 6000, and consists of slotting machines, drilling machines, milling machines, cutters, files, lathes, 'Mus' (to melt the iron), furnace, dies (moulding 'biba' of clay, specially made by them by adding gur), etc. Raw materials required by these concerns are chiefly 'beed' iron, or scrap iron (broken mill machinery parts), some pig iron (Tata's), and coal (for fuel). They receive orders directly from the mills, or mill-agents, or the mill store suppliers. About half the manufacturers at Ahmedabad, are the owners of small concerns and they earn Rs. 75 to 80 per month from this industry, others Rs. 100 to 200 according to their investments; while the labourers employed by them earn Rs. 30 to 35 per month. The industry is still expanding at Ahmedabad and hence will need some organisation to safeguard its interests. Moreover, the equipment of these blacksmiths is mostly of old pattern, and they are not aware of the better equipment, tools, etc. They, therefore, urged that the Government experts should guide them in this connection, as they are eager to go in for improved machinery.

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* It is reported by the mill machinery parts manufacturers (mostly blacksmiths) at Ahmedabad, that about 50 years ago, this industry was started by Lavji Mistri at Ahmedabad and then it grew in dimensions.

Another need of this industry is that of introducing the production of those mill machinery parts which are hitherto imported from foreign countries. If this is done, the industry will expand considerably. The mill machinery parts manufacturers should also see that their goods do not deteriorate. Some of the Mill Owners of Ahmedabad are of the opinion that English casting process is better, and the English machinery parts are of superior quality from the point of view of their demobility. Moreover, English pinions, twist wheels, etc, are more even and exact in size and weight etc., therefore, when machinery is in motion jerks are not experienced, while it is not so with those which are made in India.

TINS MANUFACTURING

We find in Gujarat in every town mostly the Bohras engaged in making tins. But the same artisans make photo frames, iron sieves, small containers, etc. They also keep rivetting materials and do some repair work. In the towns of Gujarat these 'Bohras earn about Rs. 25—40 per month. However, at Ahmedabad there are big tin (iron containers) manufacturing concerns solely devoted to the tins making.

At Ahmedabad there are 'Bohras' stoves, and umbrella-repairers, who also make tins, but as compared to the three big manufacturing concerns* their output is negligible.

These concerns are mainly manufacturing tins or containers for storing or packing butter which are mostly required by the local dairies.

Their yearly requirements of iron is of about 200 tons (Tata iron) valued at Rs. 60,000/- and their total output of tins is estimated at Rs. 1,10,000/-. About 50 labourers in all get employment and about Rs. 15000 are distributed by way of wages to them. In addition, the cost of tools, appliances, etc., amount to Rs. 12,000, while about Rs. 15000 are spent after the office and karkhana rent, municipal tax, carriage, coolie charges, etc.

From this industry, therefore, these big manufacturers are able to earn about 7 per cent on their investments.

There are 4 'karkhanas' at Ahmedabad manufacturing iron 'pips' or tubs, buckets, etc. These karkhandars require simple equipment. They require 'Eran', 'Lāg', 'Hathodi', 'Gol' machine, press, 'Kātar' (big scissors), 'Kandorā' machine (vice), etc. Each karkhandar keeps such tools of Rs. 2500 to 3000 worth. Raw materials required by them are 'khilāsari', iron sheets, rivetting and soldering material, and coal.

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*Three big concerns are those of (1) Mr. A. Husen Tinwalla, (2) Mr. Mahomed Husen Fida Husen Tinwalla and (3) Mr. M. A. Tinwalla.

They pay to the artisans on piece rate, and in all about 50 workers are employed in these 'kārkhānās' at Ahmedabad. The artisans and the labourers form their parties of 5 to 7 and they undertake to make some fixed lot of tubs. However, on an average each of the artisan gets about Rs. 1-8-0 to Rs. 1-12-0 per day, while the labourers 0-10-0 to 0-14-0 per day.

It is reported that these 4 karkhandars have invested in all about one lakh rupees in the raw materials, stock (manufactured), equipment, etc., in this industry at Ahmedabad. The iron containers and buckets manufactured by them have local as well as district markets. The raw material used is mainly Tata iron.

Almost all the manufacturers suggest that Tatas should sell the iron sheets direct to them, so that they can avoid the commission charged by their agents. Government should also help them by reducing the railway rates on the transport of raw materials used by them.

BRASS AND COPPER WORK

The census figures show us that 2723 persons are employed in brass, copper and bell-metal weres in Gujarat. However, as we shall see a little later, production of bell-metal articles has faded into insigificance, and hence few brass and coppersmiths, work out this branch of the industry. As such, most of the above workers are employed in brass and copper utensils making.

The brass and copper wares industry is both a factory and a cottage industry in Gujarāt, but over and above the Iron and Brass Foundries, already mantioned previously, there are few Metal Works in Gujarat solely devoted to the manufacturing brass and copper vessels. There is the Kant

Metal Works manufacturing brass and copper utensils and employing 15 workers at Billimora, while the Naran Lala Metal Work at Navsari employs 25 persons. In addition, there are five cocks manufacturing concerns at Surat. They are comparatively of recent origin, while at Ahmedabad Mr. Shyamlal M. Kansara prepares humidifiers of copper sheet and he has earned a name for his work. However, even with the present growth of factory life in the province, and, more so because of the heavy imports of manufactured goods from Bombay, the brass and copper smiths of Gujarat are hard hit in their handicrafts in the Province.*

Nadiad (400 artisans), Ahmedabad (250 artisans), Visnagar (100 artisans), Surat (70 artisans), Dabhoi (50 artisans), Radhanpur (40 artisans), Cambay (35 artisans), Navsari (30 artisans), and Amod† (17 artisans), these are the important centres of brass and copper work in Gujarat.‡

At Ahmedabad there are about 30 shops of retailers, and, 10 shops of wholesalers dealing in Brass and Copper utensils. These dealers import machine goods from Bombay, and they also run karkhanas at Ahmedabad; and in some of their karkhanas 'lathe' and 'press' have been recently installed. They also give outwork to other brass and coppersmiths. There are such 75 outworkers at Ahmedabad. They earn on an average Re. 1-4-0 per day, but they remain unemployed for two to three months in a year. Hence their income varies from Rs. 25 to 30 per month; while the workers in the 'karkhanas' work on piece-rate and their remuneration is according to the nature of work. They earn Re. 0-10-0 to Rs. 1-4-0 per day by putting in 10 hours' labour.

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* Among the factory goods Gujarat imports more 'tapelās' and 'tops', from Bombay, while her needs for 'golis', and 'bedās' are more met by the metal factories within the province (located at Navsari and Billimora).

† At Amod 10 brass and coppersmiths make utensils, while 1 mainly makes 'kukkar', and 6 mainly make 'chhinis' and 'pavālis'.

‡ Other centres of lesser importance are Bulsar (15 artisans), Ankleshwar (10 artisans), Godhra (6 artisans), Palanpur (6 artisans), while Broach, Patan and Kheralu, once famous centres in this connection, have now lost all their former glory.

The same is the case with the factory workers at Navsari, and at Surat, where also 'lathes' and 'presses' have been introduced in a few karkhanas.

Viewed from this angle, prominent handicraft centres of this industry in Gujarat at present are: Nadiad (400 artisans), Visnagar (100 artisans), Dabhoi (50 artisans), Radhanpur (40 artisans), Cambay (35 artisans), and Amod (17 artisans).

There are at present 100 families of brass and coppersmiths at Nadiad or in all about 400 artisans. Most of them were independent artisans upto 1930. They imported the brass and copper sheets on their own account, made the vessels and sold them to the local dealers, or to the customers, who used to approach them directly.

After 1930 the local traders at Nadiad† began to import machine made goods from Bombay, and for the goods not imported they began to put orders with the Nadiad artisans. Consequently, almost all the artisans of this centre became outworkers.

Factory goods like brass 'tapelās', 'thālis', 'vādkis', 'lotās', polished 'golis', etc. began to find more favour

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N.B.—It will be interesting to note here that one of the artisans Mr. Arjunlal Jivanlal Kassara related that first the artisans of Cutch were impoverished. Hence 'Kachhis' were first to spread themselves in other parts of India. Next the artisans of Kathiawar were rendered unemployed and they spread themselves in other parts of Gujarat and India. As a result Kathiawar artisans are found in almost all the important centres of Gujarat, and at times there exists the rate-war between the local artisans and these Kathiawar artisans.

† It would be interesting to note here that most of these local dealers are either Brahmins or Baniyas at Nadiad and not the local 'Kansārās' as they really ought to be.

with the public as they were more attractive, cheaper and better in finish. No longer, therefore, the Nadiad handmade articles could withstand the competition of these machine made goods.

Production at these handicraft centres now began to be confined to 'bedās', big and small 'pavalis', 'kathrots', 'golis'; and in addition, they concentrated more on making copper wares like 'deghādā', 'ghadā', 'pavālā', kathrots', 'thāl', 'rangheda', 'bakadiā', etc.

As copper sheets are difficult to mould on lathe, these artisans found relief that some of the copper articles have remained immune from factory production. Thus almost all the beaten wares in copper are still on the handicraft basis.

The competition of factory goods has proved very severe, as it will be easily realised from the fact that, every year brass wares, like 'khumchās', 'lotās', 'vādkis', 'baranis' 'pān' boxes, 'tapelās', etc., worth Rs. 5 to 6 lakhs are imported at Nadiad. The merchants stock these ready made goods in their shops and sell them. To this extent, therefore, the market for the local product is curtailed.

In their 'kod' (karkhana) they work upon the raw materials (brass or copper sheets) supplied to them by the local dealers. Their equipment is simple. They require 'hatodās' (hammers), 'dhaman', 'kātars' (cutters), 'sānasi' (iron holder), 'chhini', 'kharbar', furnace (bhathi) 'eran', etc., etc.

In addition they require some chemicals for soldering and cleaning the new vessels. They keep sulphuric acid, 'khadiya khar', 'lead', 'rāvati', that is rivetting materials, and coal.

For making 4 'pavālās' of 1 maund weight each, if 8 men work for 10 hours they take 2 days. Cost of the

4 maund sheets required is Rs. 56/-,* while selling price of one 'pavālā is Rs. 15-8-0 per maund, which means Rs. 62/-. But, the loss in wastage comes to about 3 seers per maund (though the wastage is purchased back by the dealer he purchases it by quoting Rs. 2 to 3 less per maund), plus in rivetting material etc., he also spends about Re. 1-8-0 in making 4 'pavālās'. The artisans receive Rs. 4-8-0 for making 4 'pavālās' which means on an average 0-9-0 per day per head. The process of making 'pavālās' is very laborious. First the sheet of the required size is to be cut, then it is to be beaten and moulded in a circular shape. Then another piece of required diameter is to be cut; and a strip is to be applied at the bottom, with the help of soldering material. Of all the processes hammering (that is beating and moulding) takes greater time. They are getting orders from the local dealers who instruct them to make, out of a given quantity of sheets, 'pavālas' of a required diameter. They are to be paid per maund of utensils a certain fixed amount.

The artisans of Nadiad report that upto 1924, the articles for which labour charges per maund were Rs. 7 to 8, for the very articles today they are paid Rs. 2-0-0 to 2-4-0. On an average the outworkers at Nadiad obtain 0-8-0 per day. But they remain unemployed for 10 days in a month. Hence the plight of these brass and copper smiths is very pitiable. Their work is reduced, and their remuneration is lowered. The total production of Nadiad which formerly is reported to be of Rs. 14 to 15 lakhs a year today stands at Rs. 5 to 6 lakhs.

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* Cost of the 7 sheets of brass weighing 2½ maunds 8 seers being Rs. 38.

N.B.—"Tran vār Kansāro, sāt vār Soni,'. A proverb is current throughout this province that, at three occasions in life (at marriage, at the time of creating separate establishment, and at death—for giving in alms) a brass and copper ware artisan is approached; while for seven occasions in life the goldsmith is approached (at birth, at naming ceremony, at thread ceremony, at the time of betrothal, at marriage ceremony, at 'agharni', and at the time of death for giving in alms.) The above proverb also holds good in another sense; that is, if the article goes thrice for repairs to a brass and copper smith it becomes obsolete, further then that it cannot be repaired; while if some ornament goes seven times for reshaping to a goldsmith it loses more than half of its value.

The demands of the Nadiad artisans are as follows:—

(1) At least the minimum remuneration of the artisans should be fixed. They must get about Rs. 30 to 35 per month.

(2) For getting out work from the dealer there has ensued rate-war among the artisans of Nadiad, hence, to safeguard against such contingencies establishment of their Association is a necessity.

(3) No artisan should be allowed to have direct dealings with the merchants who are giving orders to them. The merchants should get their orders registered with the Association, and, the Association should distribute the work among the artisans.

(4) The factories should be prohibited from producing those brass and copper wares which are made by these artisans on the handicraft basis. The factories should prepare new articles only.

(5) For the purchase of the brass and copper sheets they suggested that through the Association direct dealings with the Continental markets might prove beneficial. For, by doing so, middle man's profit (which enhances their price considerably) will be wiped out.

As regards this suggestion, it should be pointed out that, at present most of them are outworkers at Nadiad, hence they will require some financial help from the Government. For it would be very difficult for them to raise all the necessary capital. In addition, they will also require one sales depot to be opened at Nadiad in particular, and few at suitable centres like Ahmedabad, Surat, etc.

The last suggestion made by them is of general interest and common concern to all the artisans of Gujarat. They suggest that:

(6) It is necessary to establish the Union of all the expert artisans in different crafts that can maintain contact with the Government departments. Through this Union the Associations of artisans in different crafts in Gujarat should be enabled to ventilate their grievances by putting forward their case before the Government for protection, technical guidance, etc., etc. Moreover, the Union should maintain the staff of well qualified people at its Office to find out ways and means to expand the markets, etc.

Another important centre in this connection is Visnagar (Baroda) which was once very well-reputed* and leading centre of Gujarat. Even today its artisans have maintained the reputation of this craft. In its hey day it is reported that 500 brass and coppersmiths were engaged in this industry at Visnagar. At present, however, 100 artisans are employed by this industry here, while the other artisans have left this town to eke out an existence elsewhere.

There were a few independent artisans a decade ago at Visnagar. They used to import brass and copper sheets from Bombay and work upon them. But the Baroda Government in their zeal to develop Port Okha enhanced duties on the sheets imported from Bombay†. From Port Okha on the other hand, these sheets could not be imported on retail basis. This hitch in the purchase of raw materials, made the independent artisans dependent upon the local dealers. Thus the independent artisans as a class practically vanished at Visnagar.

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* Formerly copper sand was received at this centre, later on copper 'gathā' (ingots) were imported, with the march of Science-copper 'pāttā' (copper bands or rails) were imported, and now the ready made sheets. Thus Visnagar happens to be historically very ancient home of brass and copper ware industry of Gujarat. Kavi Dalpatram has sung to its glory "Visalnagar vās Karasho, pātra jnyā pittal tanā", that is, 'ye, travellers, stay for a few days at Visnagar which is noted for its brass utensils.'

† Because of the great agitation, these duties were abolished later on by the Baroda Government from 22-9-38 onwards.

Just as in Nadiad, we find the artisans of Visnagar mostly to be the outworkers. They have no money to invest in the raw materials, hence they obtain their requirements from the dealers* and they get their remuneration on piece rate *i. e.* per maund per shape on the utensils made by them.

At present these artisans get orders to make brass and copper 'charudis', 'ghadās', 'charoos', 'golis', 'karabās', 'deghadās', etc.; because of the Visnagar's established reputation these articles find markets everywhere. But the 'thālis, 'vādkās', 'lotās', which they used to be made at this centre are no longer in demand. They are now imported from the factories of other centres like Bombay, Rajkot, etc., even for local consumption.

If an artisan works for 8 to 10 hours a day, within one month he can mould 5 maunds sheets into required shape. For making utensils one maund in weight Rs. 6 to 7 were obtained in 1927–28, and even more Rs. 10 to 12 before the last World War. To-day hardly Rs. 2 to 3 are obtained for the same articles per maund. If more laborious utensils like 'hāndās' are made of course more remuneration is received, but then, more time is to be devoted in making. Hence the monthly income, of an artisan in this industry is hardly Rs. 12 to 13 per month.

A special note should be taken about the fact that formerly together with the exports of utensils, exports of cast brass, and the cast copper goods were taking place from Visnagar. About 80 to 100 maunds of such goods were yearly exported from this centre to places like Ahmedabad,

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* There are 18 shops at Visnagar dealing in brass and copper utensils.

Harij, Radhanpur, Wadhwan Camp, etc. The articles thus exported were 'kadās' (for the 'kundis', 'charus', 'deghs', etc.), 'sil' (for 'charudis'), etc.

Present export of these goods from Visnagar is practically nil. It seems that now at the centres of export these articles are already made, or else, they obtain them from some other convenient sources (like iron and brass foundries) at cheaper rates.

Artisans of Visnagar have made several representations to the Baroda Government in the past. Their demands are :-

(1) Prohibitive duties should be imposed on machine-made (factory) goods imported within the State territories†.

(2) Baroda State should introduce lathes and presses (that is machinery) at Visnagar so that, imports of manufactured goods might be stopped on this part of the State, and, some artisans might get employment in those factories.

(3) The State should guide the artisans in improving the quality of the goods produced from the point of view of their finish, processes, etc., and also, in preparing the articles of new patterns.

(4) The State should establish a small factory at Visnagar to melt the wastage of sheets (scrap brass and scrap copper). So that sheets or ingots made from the scrap might be available to the Visnagar artisans at lower rates.

(5) The State should at least introduce polishing machinery at Visnagar.

(6) The art of tinning the vessels should be introduced at Visnagar.

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† The dealers of Visnagar, however, argue that this might induce the consumers directly to bring ready made goods from Ahmedabad. But to us this argument does not appear to be so sound, for, such purchases cannot be of substantial quantity.

(7) Lastly, the production of the articles of necessities (daily requirements) for household purposes, e.g., 'thāli', 'vādkā', 'tapeli', 'tānsalā', 'goli', etc., should be on handicraft basis, while of those like 'pāndāni', 'divi', 'ārti', 'Ghantadi', etc., might be on machine basis.

Some of the above demands appear to us very sound, while, others, even if they are met with we think that the desired effects will not be achieved. We believe:—

(1) If the Baroda State puts an embargo upon the imports of machine goods, it will result in the introduction of more lathes, and, presses within the State, that is the establishment or expansion of metal factories in the State. From the point of view of employment, this will have a beneficial effect, for, these factories shall have to employ the required number of persons from among these artisans.

(2) Introduction of lathes and presses at Visnagar, also means introduction of more factories within the State territory and hence this also will serve the above purpose.

(3) As regards technical guidance, something no doubt can be achieved by proper direction from the State experts. But, as regards the introduction of articles of new patterns, much useful work cun be rendered by expanding the activities to improve the art-crafts in this industry. It is gratifying to note that metal work in art-crafts is receiving the attention of the State authorities. In the Diamond Jubilee Cottage Industries Institute of the Baroda State, metal work is taught.

(4) As for the introduction of a small factory at Visnagar to manufacture brass and copper sheets from scraps we do sound a word of caution. Before going in for such a scheme, feasibility of the proposition should be investigated. Whether enough scrap iron, to run the factory on a profitable basis, will be available and if so, will these sheets, made from the scrap iron, be as strong as the new imported ones ?

On the other hand, we might suggest the establishment of a small foundry at Visnagar that can manufacture cast goods of brass and copper.

As we have already pointed out, once such cast articles were exported from Visnagar and by introducing machinery in this branch of industry (as the goods will be made available at cheaper rates), some of the lost markets might be regained, or new ones created.

(5 and 6) We do uphold the demands, for the introduction of (*a*) polishing machinery, and, (*b*) the art of tinning the vessels with all the required equipments at Visnagar. This is the centre where something like 2500–3000 maunds of copper and brass sheets are imported annually, and about 2000 to 3000 maunds utensils are made, which means about 1 lakh rupees worth utensils are made at this centre. It is, therefore, a sufficiently important centre, where all such innovations will result in the well being and expansion of the industry.

Lastly, (7) about their demand, that the articles of necessities should be produced on handicraft basis, and, of luxuries should be produced on machine basis, requires State regulation.

Under the existing individualistic system if the State aims at creating new avenues of employment without dislocating the existing ones this demand holds good. However this is a very controversial point and we refuse to touch it at a greater length in this treatise.

The same condition prevails among the artisans at Radhanpur, Cambay, Amod, Dabhoi, etc.* But Dabhoi happens to be favourably situated, and as it is relatively a small centre, its productions are mostly purchased by the dealers of ready made utensils of the adjoining towns and villages who often pay visits to it for making purchases. Dabhoi's vessels are mostly purchased by these merchant customers (that is, it is the 'vachhäti-gharāki'). Merchants of Sinor, Talakwādā, Rājpiplā and other adjoining places often make their purchases of handicraft goods from Dabhoi.

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*It would be interesting to note here that the artisans of Rajpipla, Radhanpur, Cambay, etc., reported that Muslim females favoured more the use of copper utensils (especially of their main item copper 'bedas') rather than the Hindu females.

As we have noted above with the introduction of machinery in this industry their remuneration has gone down. The artisans hardly earn Rs. 12 to 13 per month, and their conditions are far from being satisfactory. The brass and copper ware industry is next to handloom weaving in its importance among the urban handicrafts, and its present state of decline is a matter of serious concern to all those who are interested in the upkeep of urban handicraft economy.

BELL-METAL WORK

In the Western countries, because of the use of earthenwares and, glasswares, the use of this metal remained confined to the preparation of 'bells'. As mostly the bells for churches were made from this metal, it came to be known as bell-metal. However, in India it was found that in the utensils made out of this metal, milk and other things could be preserved for long time, hence its use for the daily house-hold purposes began to spread. From the compound of copper and tin, the karkhandars could make this metal and its utensils began to find greater markets. In its hey day, it seems something like 1000–1200 artisans were employed by this industry in Gujarat.*

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*Dholka (having 180–200 artisans in its hey day) and Cambay (having 120–150; artisans in its hey day) once known for bell-metal wares have now faded into insignificance; while at Palanpur and Juna-Deesa more artisans were employed by this industry in the past. In a few centres some stray work in bell-metal wares was also carried out.

It is reported that there were something like 20 'kārkhānās' for making bell-metal utensils at Visnagar, but, at present there is only one karkhana where 8 artisans are employed.

" It is the introduction of the art of tinning the vessels, that fast replaced the use of bell-metal wares, and, now there is no possibility of reviving this industry to its past level." This is the general opinion of all the 'Kānsāghadās', that is, the bell-metal artisans of Gujarat. Bell-metal utensils are neither cheap,* nor so attractive, hence this better invention has proved a double blessing to the consumers. By the passage of time, the tinned vessels outwitted the demands for the bell-metal wares with a result that now only the backward communities or very orthodox people demand these articles. Mostly the 'thālis' and 'tānsalās' are demanded by the Kaliparaj or Raniparaj tribes, for a belief prevails among them that these utensils are so holy that the evil spirits remain away from them. Among certain Brahmins, on the other hand, there is still the custom of presenting the bell-metal utensils to the bridegroom at the marriage festival.

At present hardly 50 artisans are engaged in this industry in Gujarat. Kansara Nathalal Zumakhram (at Palanpur) informed us that hardly in a year he prepares one or two bhathis. Mr. Sankalchand Kansara's Karkhana at Visnagar, two karkhanas of Juna-Deesa, and one of Pardi still concentrate more on the making bell-metal wares. Briefly summed up this industry is spread in Gujarat as follows :—

Pardi 8 artisans and one 'karkhana', Visnagar 8 artisans and 1 karkhana, Juna Deesa 16 artisans and 2 karkhanas, and Palanpur 8 artisans and one karkhana.

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*Whereas brass utensils are available at Rs. 24 to 25 per maund, bell-metal utensils cost Rs. 45 to 50.

The artisans of Visnagar, Juna Deesa, and Palanpur mostly make 'thāli', 'tānsalā', 'Vādkā, and 'chhāliyā', while in addition to these, the artisans of Pardi also make 'trānsā', 'kirtal', 'ghant' (bell), etc.

As the demand during recent years is greatly reduced, the karkhandars now purchase old scraps of broken bell-metal utensils, at all the above mentioned centres, add necessary tin to it while melting the same, and, make new utensils. But it is a very laborious process to melt the bell-metal.*

Among these karkhanas the leading one in Gujarat is that of Mr. Bhagwanlal Vithaldas at Pardi. The proprietor when interviewed informed us that formerly he used to make utensils 160 maunds (Surati) in weight† every year. But now he hardly makes 125 Surati maunds per year. The demand is thus gradually decreasing.

As for the equipment of his karkhana in all it was Rs. 300/- worth. He required 'hathodā' (hammer), 'sānasi', 'khilli', 'ghan', 'mogari', 'kuladi', 'mus', etc.‡ For polishing purposes he required 'ren', 'kalai', etc.

In addition, he required bell-metal scraps, tin, timber, castor oil, and, the dies or moulds (specially made by him at home from paddy husks and clay).

From 6 maunds scraps hardly 3 maunds utensils can be made. For in beating the red hot bell-metal disks (the metal is so hard that it breaks if it becomes slightly cold) breakages often occur, and the slight breakage renders all the labour devoted to make the article futile. As slightly damaged article is no good for any use, and, it is again treated as scrap metal. In making utensils from a 'bhathi' of 6 maunds scraps, one day is taken in melting the scraps, 4 days are required in casting and moulding; 2 days in beating ('mathār kām'); and 3 days in polishing. Thus after 9 or 10 days, 3 maunds utensils are ready. The cost of this 'bhathi' comes to Rs. 183-12-0,* while the utensils prepared fetch Rs. 50 per maund, which means Rs. 150.

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*There is a proverb in Gujarat " Gāle kānsu ane pāde ānsu", that is, while melting the bell-metal even tears come out of the eyes.

†Surati maund means 37 seers.

‡He has 1½ dozen big and small hammers (Re. 1-0-0 to Rs. 2-8-0 each); 'sānasis' one dozen (Re. 0-12-0 to 0-14-0) ; 'ghans' 1½ dozen (Rs. 3-0-0 to 4-0-0 each) ; 'mogaris' 5 to 7 wooden (Re. 0-8-0 to 0-10-0 each) ; 'mus' 2 dozen (Rs. 3-12-0 each) etc., etc.

Obviously therefore, it appears that the 'karkhandar', works at a loss. However, in the second 'bhathi' which he prepares, 3 maunds scraps are already made available to him by the first one. His expenditure over the second 'bhathi', therefore, is Rs. 117-12-0. Hence by the second 'bhathi' he makes good the loss of the first 'bhathi'.

Thereafter he earns about Rs. 30/- per 'bhathi'. In all, he informed us, that at present he makes 125 (Surati) maunds utensils, which means about 113 maunds (of 40 seers) utensils; that is he prepares about 36 'bhathis' a year. His annual earning is, therefore, Rs. 1122, which means he earns Rs. 85 per month.

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*Rs.	132—0—0	scraps 6 maunds.
,,	0-14—0	tin (half a seer).
,,	10—8—0	timber (1¾ khandi).
,,	0-14—0	cartage for timber fetching.
,,	5—0—0	castor oil and mus. (5 seers castor oil is required per bhathi and 'mus' costs Rs. 3-12-0 each. 2 dozen 'mus' are required in a year.
,,	27—0—0	6 men's labour charges for looking after a 'bhathi' for beating, and moulding (4 days are taken by this process and each of them is to be paid Rs. 1-2-0 per head.
,,	7—8—0	for polishing the utensils (Rs. 2-8-0 per maund they charge. Three days are taken in it).
Rs.	183-12—0	Total.

It is also a matter of solace to him that he is able to employ two or three family members, or relations in this industry. One of the 'kārkhāndārs' desired that as the demand for the bell-metal utensils had greatly declined, the Government should patronize this industry by introducing the use of bell-metal wares in jails.

As for the expansion of this industry it should, however, be noted here that when the brass utensils are available at Rs. 22 to 23 per maund, bell-metal wares cost Rs. 45 to 50. Hence the price difference is so great that it is not possible to popularise them for daily use. Mostly the products of this industry will be 'bells', 'kirtāls', 'trānsās', and such other musical instruments. But all the steps, to put this industry on a more scientific basis, are welcome. It is reported by the Gujarat karkhandars that at Revadi (in the Punjab) machine roll is used for cutting the sizes of the bell-metal utensils. Such new innovations need to be introduced in Gujarat karkhanas. All possible guidance as regards improvement of the technique is welcome, for, up till now they have stuck to their old technique and procedure of melting the metal and preparing the utensils. They are not at all conversant with the better technique or procedure.

MANUFACTURE OF SILVER AND GOLD ORNAMENTS

As regards the gold and silversmiths, we find them working in almost all the towns and in the big villages of Gujarat.* A goldsmith working in a big village gets customers from the adjoining small villages and he is able to earn Rs. 15 to 20 per month. Mostly he gets repair work, or the worn out ornaments for reshaping. Compared to the brass and copper smiths, his condition is relatively better; for as yet this industry for most of its demands is on the handicraft basis. Moreover, in smaller villages imports of ready made silver or gold ornaments do not take place; as the 'chokshis' cannot afford to open up their shops in such small localities. The villages, in addition, have special regard for the word of a goldsmith rather than that of a 'chokshi' who only sells ready made ornaments.

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* The census reports give the distribution of "makers of jewellery and ornaments" according to district, division or State, as follows :—Mehsana (1236), Surat (1230), Ahmedabad (1203), Baroda (1053), Cambay (658), Kaira (634), Navsari (602), Panch Mahals (395), Palanpur (383) Idar (209).

But these localities are now visited by the hawkers who sell imitation or electroplated wares at cheap rates, and, hence, the goldsmiths want that they should be forbidden from visiting these small areas.

Ahmedabad (850 artisans), Baroda (522 artisans), and Surat (300 artisans) are the leading centres of Gujarat for gold and silver ornaments making.

Their equipment consist of 'hăthodă', (hammer), funkani (wind blower), 'kătar' (big scissors—cutter), 'jatardi', 'divi', 'eran', 'chipiyo', 'samăni', big 'sănasi', big 'jibhi', dies, 'mus', etc., etc.

The owners of the big shops (such 35 are there at Ahmedabad) who invest Rs. 10,000 to 15,000 earn about Rs. 250-300 per month. Mostly at these centres 60 per cent gold work and 40 per cent silver work is done. Before the last World War they used to get good remuneration and used to pay Rs. 2-0-0 to 2-8-0 per day to the artisans whom they gave outwork or employed in their shops. But to-day the artisans hardly get Re. 1-0-0 to 1-4-0 per day, and, they are paid on piece rate according to the nature of work and labour involved. They now earn Rs. 30-35 per month.

The artisans at the other important centres of Gujarat like Nadiad (150 artisans), Rajpipla (35 artisans), Radhanpur (35 artisans), Bulsar (35 artisans), Broach (30 artisans), Godhra (25 artisans), Palanpur (25 artisans), etc., earn Rs. 22-25 per month.

They find their remuneration curtailed because of (1) the depression (as less orders are received at present), and also (2) the opening up of the Novelty Shops and the 'chokshis' shops selling ready made ornaments in the towns and cities. These shops import electroplated German silver ornaments, presentation sets, etc., and have attracted about 8 to 10 per cent of the indigenous trade.

(1) If these shops are closed and (2) more polishing shops are established at suitable centres in Gujarat and, in addition, (3) the art of making dies of different designs is introduced, this industry will regain most of its lost markets.

Other centres of Gujarat like Patan* (60 artisans), Idar (50 artisans), Borsad† (9 artisans), etc., mostly concentrate on making silver ornaments. Here the goldsmiths make 'kadlā', 'sānkalā', 'hānsadi', 'bedi', 'chudi', 'kandorā', 'todi', 'chhadā', etc., etc., and these ornaments are favoured by the local people.

The artisans at these centres earn about Rs. 20/- per month, while, the owners of the shops with their Rs. 4000—5000 worth investments earn about Rs. 50 to 60 per month.

The greatest grievance of these centres is of the visits of the hawkers, especially Memons, from Cutch and Kathiawar side, and, Bohras from different parts of Gujarat. They visit Idar, Rajpipla, and other centres and sell cheap or imitation ornaments like 'butti', 'lavingiya', ear-ring, nose-ring (nath), necklace (achhodā), bangles etc., etc. Mostly these are rolled gold ornaments or electroplated German silver wares. All these artisans complain that these hawkers should be prohibited from visiting their areas. In addition, they require better dies, and machinery for (1) making 'tiki, as well as (2) drawing the wires.

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* Two artisans of Patan are known for their silver work on hubble bubble; Nadiad is also famous in this connection in Gujarat; while Navsari is known for the manufacture of silver utensils.

† Borsad goldsmiths also export silver ornaments to Bombay and Ahmedabad.

CHAPTER X

LEATHER INDUSTRIES

THE Census Reports give us the clue that there are 20905 workers engaged in industries connected with the hides and skins and hard materials from the animal kingdom. These workers can further be classified as follows:—

Workers in Leather	20550
Bone, Ivory, Horn, Shell, etc. workers ...	276
Furriers, Brush Makers, etc.	79

The artisans following the two latter occupations are negligible in number. The really important class under this head consists of the workers in leather or tanners. Their concentration in Gujarat is found within the following areas:—

	Number of Workers
Mehsana Division	5,945
Ahmedabad District	3,593
Palanpur State	1,731
Kaira District	1,576
Idar State	1,445
Baroda Division	1,090
Surat Division	976

The leading tanning centres of Gujarat are Ahmedabad, Godhra, Nadiad, Broach, Baroda, Idar, Visnagar, Patan, Surat, Ankleshwar, Vadali, Dholka, Sunkesh, Kachholi and Lilapur.

Sunkesh, Kachholi and Lilapur, though comparatively small, have gained fame because of the improved quality of tanned hide that they are producing and the special care they take in all the processes of tanning to see that the quality of the hide does not suffer.

Tanning is mostly carried on in cottages in the scattered villages of Gujarat. The tanners use simple implements like 'rampi', 'koyto', 'kundo', 'knife', etc. They have at the most a few large earthen pots buried in the ground without even a roof over them, in which the proprietors turn out a few tanned hides per month. These earthen pots are usually known as 'kunds' or pits, and they are located mostly on the outskirts of the villages. Water used by these tanners is often muddy and during summer there is a dearth of even the muddy water.

Lime, 'babul' bark, 'aval', 'harda', 'ghatbor', turwad bark, oil, salt, 'ankda nu-dudh', etc., are required as tanning materials, and most of these materials are locally available. The cost of the pit is about Rs. 7/- and the villager on an average tans 5 hides per month, and earns Rs. 5 to 7; but he does not find enough work all the year round; hence, he works in the field as an agricultural labourer during the monsoon. The tanners of the extreme north do not know the lime process (tanners at Dholka, Bavla, Radhanpur, Palanpur, Idar, Lunawada, etc.) and they use 'ankda-nu-dudh', salt, etc. They are anxious to learn the lime process which results in the production of more polished leather.

Generally the hide is allowed to soak in lime water for three or four weeks till it is divested of hair. It is then saturated there several times with a solution of 'babul' bark. But the grave defects in the handling of the tanning processes are (1) the use of crude knife and (2) the absence of the use of wooden beam. As most of the tanners in the scattered villages do not possess wooden beams, and use crude knives, scratches often occur on the leather in the process of taking out the hairs. If, therefore, adequate propaganda is made about the use of the wooden beam worth Rs. 3 to 4 and the special knife available

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*To give practical demonstration to the tanners, special demonstrators are appointed, one by the Bombay Government at Kalak (Jambusar Taluka), one by the Baroda Government at Baroda, and the other at Patan.

at Rs. 1-8-0, much of the damage will be avoided. Need for the demonstration of the better instruments cannot be under-rated in this connection. The demonstrators of the State should move from place to place and they should show to these tanners how, by the use of better implements, they would benefit, and if tanners are ready to purchase these implements, they should supply them on the spot.

As for the economic condition of the tanners the artisans interviewed at Ovada informed us that he required about 50 maunds of raw hides per year. For finishing one maund of raw hides he used 5 seers of lime, 2¼ seers of salt, 2 maunds of babul bark and 10 annas worth 'harda'. The raw materials were locally purchased and the tanning was done by the crude bag process. The finished hide was sold by him to the local shoe-makers as well as to the shoe-makers of the surrounding villages. On an average, he got an income of Rs. 7/- per month.

The artisans in this industry are illiterate. One of the artisans at Ankleshwar gave us the following information. There were 200 kunds of tanners at Ankleshwar upto Samvat 1974 (that is upto 1923–24). As there was a great demand of the tanned hides for washers manufacturing at Nadiad, Broach, Cambay and Kadi, tanners all throughout Gujarat get sufficient orders to keep them well employed throughout the year. In addition, 'kullas' (leather containers), 'kosh' or mots, 'deshi' (native) shoes, etc., were also more in demand. Hence, more tanned hides were demanded by the shoe-makers, dabgars, and others. But the size of the tanning industry was gradually curtailed; first with the introduction of 'tins' as ghee containers, and then, with the introduction of 'renhts' in the place of the mots, and later on with the increasing use of chrome in making, boots, shoes, sandals, etc. The severe fall in the demand of the tanned hides of Gujarat was felt by the importation of the American chrome wastage for washers manufacturing. Hence, after the year 1922 the number of the tanners unemployed began to swell. Consequently everywhere half the number of pits are now lying idle in delapitated conditions. At Ankleshwar also, in confirmity with this picture, out of 200 pits only 100 pits are now in working order.

The remuneration from this industry has also gone down considerably; and as the Ankleshwar artisan informed us, he tanned 5 hides (2½ maunds) of Rs. 17-8-0 worth in one month. He spent Rs. 5-5-0* on tanning materials, and obtained Rs. 32-8-0 from the sale proceeds of the tanned hides, by selling them at Rs. 13 per maund. In all, therefore, he got Rs. 9-11-0, that too, when his family members helped him in various processes. Formerly, that is, before 1920 he used to earn Rs. 18 to 20 per month.

The tanners of Gujarat usually tan the buffalow, cow and bullock hides, and the raw skins are generally exported to other countries. Hence to develop the use of the hides and skins within the province, chrome tanning, tanning of skins, establishment of small workshops for preparing leather suit cases, attaches, purses, belts, leather carriers, straps, etc., are some of the suggestions received by us.

There are 25 big tanneries‡ in Gujarat employing in all about 350 persons. Proprietors of these tanneries employ 8 to 20 workers according to the capital at their disposal. They employ these workers on piece work. One such big tannery proprietor in the interview informed us that he employed 20 workers on piece work throughout the year. His equipment was worth Rs. 900. He had purchased 810 maunds of cow hides and 270 maunds of buffalo hides at a total cost of Rs. 7500/-. The tanning materials ('turwad' bark, 'harda', lime, etc.) cost him Rs. 6000/-. Most of the raw materials were purchased by him from the local markets.

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*Re. 1-4-0, ½ maund lime (0-1-0 per seer); Rs. 3-12-0 Baval bark 5 maunds (0-12-0 a maund), and 0-5-0 til oil (per hide ½ seer required at Re. 0-2-0 per seer.)

‡13 at Godhra, 5 at Surat, 4 at Baroda, 2 at Navsari, and 1 at Vijapur.

The tanned hides were sorted according to their quality and the best ones were exported to Bombay. Others were sent to Surat and some were used locally. His total sale proceeds were Rs. 17000/- for the year 1937-38 and after paying all the expenses of the 'karkhana' he received Rs. 1200/-. The wage earners who were employed by him earned Re. 0-4-0 to Re. 0-8-0 per day; and on the whole they obtained Rs. 6 to 7 per month.

These big factory owners informed us that instead of earthen pots, if the better pits are used by the tanners, with tin roofs, the quality of the tanned hide will not suffer so much as it does at present.

Imports of ready made shoes, and leather articles, and the use of imported chrome leather and chrome wastage, has (1) resulted in the curtailment of the markets for tanned hides, (2) lowered their price (3) lowered the remuneration of the workers in this industry and finally, (4) given impetus to the exports of raw hides and skins.

There were formerly two chrome tanning factories at Ahmedabad; but at present only Ahmedabad Chrome Tanning Company is working. It employs 46 persons. The quality of the output of this factory is inferior. The karkhandar informed us that the Ahmedabad water did not suit the leather, moreover, the site chosen by him for the factory was not properly selected.

It is, therefore, desirable to select more suitable centres like Dholka, Idar, etc., for establishment of chrome tanning factories.

Dholka happens to be on the border of Gujarat and Kathiawar, hence can easily depend upon the raw hides exports of Kathiawar for raw materials. While as for Idar it happens to be one of the leading tanning centres even to-day and exports of raw hides from that territory run into thousands.

The scope for tanning is considerable in Gujarat as every year raw hides and skins are exported in huge quantities from Radhanpur, Idar, Palanpur, Lunawada, Baroda, Rajpipla and British Gujarat.

SHOE-MAKING

The census figures give us that in Gujarat there are 4985 boot, shoe and sandal makers. Throughout the province the shoe-makers are found spread in the cities, towns, and villages. They are mainly concentrated in the following area :—

Mehsana Division	...	...	...	1427
Baroda Division	...	...	...	900
Ahmedabad District	...	...	...	572
Navsari Division	...	...	...	517
Baroda City	...	...	...	286

In our survey we found more concentration of shoe-makers in the following places :—

Centre				*No. of Artisans*
Ahmedabad	...	...	...	400
Baroda	...	...	...	286
Surat	...	...	...	200
Palanpur	...	...	...	90
Nadiad	...	...	...	60
Visnagar	...	...	...	60
Umreth	...	...	...	60
Radhanpur	...	...	...	40
Godhra	...	...	...	40
Dahod	...	...	...	35
Himatnagar	...	...	...	30
Idar	...	...	...	30
Patan	...	...	...	25
Lunawada	...	...	...	20
Bulsar	...	...	...	17

Hence these are the leading shoe-making centres of Gujarat.

At these centres the shop keepers or the master workmen engage artisans on wages and pay them Re. 0-8-0 per pair of slippers, and Re. 0-2-0 per pair 'champals'.

The equipment required by the master workmen consists of a sewing machine, and other simple tools and their cost does not usually exceed Rs. 200/-

By employing these boot makers and one champal maker on piece work, the master workman earns Rs. 35 to 40 per month; while the artisans engaged by him earn about Rs. 15 per month. The independent shoe makers at these centres earn Rs. 20 to 22 per month.

One of the Broach shoe-makers pointed out to us that the pair of shoes he was making required chrome of Rs. 0-12-0, 'astar' lining Re. 0-6-0, sole leather, etc. Re. 1-0-0 and labour charges Re. 0-12-0, in all it would cost him Rs. 2-14-0 and he will obtain Rs. 3/- to 3-2-0 for that pair. Hence hardly two to three annas he earned per pair.

Before 1920 his remuneration was much more as he used to earn Re. 0-8-0 to Re. 0-12-0 per pair. The economic condition of the shoe-makers in villages is far from being satisfactory. They get grain from the agriculturists, and, render several odd services to them. They repair their shoes, mots, etc. They hardly earn Rs. 7 to 10 per month, that too they are more paid by the agriculturists in kind rather than in money. The demands of the shoe-makers, in a nut shell, are the following :—

(1) Complete stoppage of rubber, canvas and other foreign footwear by imposing prohibitive duties upon their imports.

(2) Increase in the duties of the raw hides exports, so that they may be made available to them at cheaper rates.

(3) Establishment of factories within the province from which they can obtain their requirements of patent leather, chrome and willow calf leather.

(4) Abolition of all the State and Municipal duties on the exports of the locally made boots.

(5) Enhancement of the duties on the local imports of factory goods from Companies like Flax, Bata, etc.

Imports of all-leather boots and shoes are considerable in Gujarat. In addition, leather belting machinery and other manufactures are also imported in large quantities. Hence, the establishment of such factories at suitable centres within the British Areas and Baroda will result in a double blessing. They will give employment to the local artisans, and incidentally they will bring about a rise of home market for the consumption of the raw hides and skins which are now exported to foreign countries.

As we have already pointed out formerly, raw skins are exported from the province in huge quantities, and the development of skin tanning has not received proper attention in this province.

'KULLAS'*...WIND-INSTRUMENTS...ETC.

In former days before the iron tins (containers) were available all throughout Gujarat 'Dabgars' were engaged in making 'kullas' or leather containers. About 8 months in a year they devoted themselves to this industry and for four months they used to make umbrellas. These industries brought them Rs. 10 to 12 per month in by-gone days, however, both these industries are now practically extinct from the province. For 'kullas' are rarely in demand, while umbrellas are now manufactured in big factories outside this region. At present, therefore, we find some trace of the 'kulla' making in Gujarat at rare centres like Lunawada, and, Virpur (Baroda).

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*Dabgar Kachrā Bhagā at Santrampur informed us that after Samvat 1956 (that is 1900 A. D.) 'kulla' making is given up in almost all the parts of Gujarat. Formerly, 'kullas' of the capacity of one seer to five maunds used to be made by the Dabgars. By making a 'kulla' of one seer capacity Re. 0-1-0 to Re. 0-1-6 were earned by way of labour charges by the Dabgar.

Side by side with the 'kullas', 'trajvas' (leather balances) and shields ('dhals' or leather protectors) were also made by the Dabgars. Once 'dhals' used to be exported from Gujarat to other parts of India. But all these are at present the extinct industries of the province.

But the Dabgars are still found busy making musical instruments such as 'tablas', 'mrudang', 'narghās', 'dokads', 'dholaks', 'padghams', drums, 'nagārās', 'pakhāj', etc., etc. In this connection well-known centres of Gujarat in making musical instruments are the following :—

Centre	*No. of artisans*
Lunawada	40
Vadnagar	20
Patan	8
Balasinor	7
Modasa	5
Rajpipla	3
Sankheda	1
Jaghadia	1

Except these centres all over Gujarat the Dabgars are unemployed, and, mostly they work as agricultural labourers. At times they remove the dead cattle or collect raw hides and export them; but everywhere their condition s pitiable. They have already lost their old occupation of making umbrellas, kullas, etc., while new avenues for eking out their existence they have found none.

The artisan at Rajpipla informed us that he received wind instruments like 'mrudang', 'dholak', etc. from

Umreth, Dakor, Nadiad and other centres of Gujarat for repairs. Upto 1918* Rajpipla's 'mrudangs', 'dholaks', etc. were more in demand, and orders were received from distant places like Nasik, Trambak, Junagadh, Rajkot, Gondal, Morvi, Dhrangadhra, Bhavnagar, etc. by the artisans of Rajpipla.

Rajpipla's speciality all the while was the preparation of 'dokad' from 'biyo' wood. But later on cheaper quality 'dholak', 'mrudang', etc., were made at the centres like Baroda and Ahmedabad from timber (sag), and this gave a setback to the better quality Rajpipla manufactures.

At the most 10 dholaks can be made in a day. Even then to carve the wood Re. 0–3–0 per dholak have to be paid while the helper who moves the wheel is paid Re. 0–1–0 per dholak.

Hence Rs.	2–8–0	for labour to prepare 10 dholaks
	10–0–0	wood (cartage, etc. included)
	2–0–0	to the contractor
Rs.	14–8–0	

The selling price of the dholak is Rs. 1–8–0† each. Hence Rs. 15–0–0 are obtained. As the ware and tare of the 'vānsalo', 'vinjalo', etc., are nominal, the artisan earns about 8 annas to 10 annas per day.

The artisan at Modasa was engaged in 'tablā' making. He informed us that he required iron dust, smoke, wheat flour, laces from buffalo hide, goat skin, and timber. By putting in 10 hours' work he could make only one pair of 'tabla' per day; and he hardly earned annas eight to ten per day; that too, when other family members helped him in various processes.

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* Samvat year 1974.

†Sometimes the same dholak also fetches Re. 1–10–0 each.

ROLLER SKINS MANUFACTURING

There are two 'karkhānās' at Ahmedabad manufacturing roller skins. The principal raw material they require is goat skins. Three artisans within 4 days can prepare 3 dozen roller skins if the kārkhāndār and his family members also help them in various processes. The artisans are paid Rs. 20 to 25 per month.

One of the kārkhāndārs informed us that he employed 4 artisans, and his yearly requirements of the raw materials were goat skins Rs. 5300 worth, fat 10 tins (at Rs. 5 each) Rs. 50, castor oil 100 tins (at Rs. 5-8-0 per tin) Rs. 550. He prepared 200 dozen roller skins and sold them at Rs. 15 per dozen. In addition, he sold leather laces, oiled as well as dry, worth Rs. 4800. He sold leather wastage to shoe repairers at Re. 0-6-0 per ratal, and obtained Rs. 100. He paid kārkhānā rent Rs. 25 per month. He thus earned Rs. 500 per year with the help of his family members, who all worked with himself in the kārkhānā all the year round.

The other factory (kārkhānā) at Ahmedabad is very small. Only 2 artisans are employed in this kārkhānā, and its output is hardly ¼th of the above factory.

The roller skins are purchased by the textile mills. Hence their market is local. But larger quantity of the roller skins is imported from abroad every year. There are good chances for this industry to develop at Ahmedabad, provided some guidance is given to these manufacturers in the direction of the improvement of their quality. Locally manufactured roller skins are no doubt cheaper, but as for the quality, the foreign imported roller skins are definitely of superior quality. If, therefore, proper steps are taken to develop this industry it will show considerable expansion. Roller skin makers of Ahmedabad, are 'Mochis', and they are illiterate. They, therefore, cannot devise ways and means to improve the quality of their goods, or develop the markets for their products.

PICKERS MANUFACTURING

Kadi (Baroda) was once a welknown centre of Gujarat that used to export pickers to other provinces in India. But with the rise and growth of textile mills at Ahmedabad it lost its former importance and gradually faded into insignificance.

Pickers manufacturing was first introduced at Ahmedabad by Mr. Mahomed G. Mansuri in 1914, and, as years rolled on, other 'kārkhānās' came to be opened at this centre. Consequently it has now become the prominent centre for pickers manufacturing. At present there are 6 kārkhānās at Ahmedabad employing in all about 200–250 workers. The total volume of output of this centre appears to be 12000 gross pickers valued at Rs. 3,10,000. This industry requires big premises, good investment and employment of a number of hands, yet it is a cottage craft.

Ahmedabad, being the prominent centre for Textile Industry in India, requires lakhs of rupees worth pickers every year. The market for pickers is, therefore, assured at this centre. It being so, this industry, though comparatively of recent origin, has good prospects, provided it is handled carefully by expert hands in this its initial growth.

One of the pickers manufacturers when interviewed informed us that his equipment was worth Rs. 11000/–.* Raw materials at his disposal (raw hides, sodium sulphate, acetic acids, lime, chemicals, nails, wires, etc.) were Rs. 9000/– worth; stock of pickers manufactured Rs. 22000/– worth; and his outstandings (for goods sold on credit) were Rs. 25000/–. On the other hand, he himself was indebted to raw hides dealers and sperm oil vendors to the extent of Rs. 12000/–. With these investments he as well as his partner earned Rs. 200–250 per month.

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*His equipment consisted of Pressing Machines Rs. 400 each, Drilling Machines Rs. 50 each, Punching Machines Rs. 40 each, Dies average Rs. 20 each, Preliminary Pressing Machines Rs. 150 each, and, files for drilling, drilling tools, vices, etc. etc.

The monthly accounts of this partnership firm showed us the following position :—

Rs. a. p.	
4200–0–0	Raw hides 25 kodis (12 maunds per kodi and Rs. 12 per maund).
25–0–0	Lime 50 tins at Re. 0–8–0 each
112–0–0	Iron wire 8 cwt. (at Rs. 14 per cwt.)
21–0–0	Sodium 2 cwt. (at Rs. 10–8–0 per cwt.)
25–0–0	Fine nails (per gross pickers half a packet is required)
62–8–0	Sperm oil
1600–0–0	Labour charges*
150–0–0	Packing charges
108–0–0	Sundries, carriage, coolie etc.
6303–8–0	

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*As for the labour charges he employed 51 persons and the account sheets showed the following expenditure :—

Persons employed		Rupees paid
8	'Valatarivala', Rs. 44 each per month	352
4	to attend cutter Rs. 29 each per month	116
4	to attend pressing Rs. 28 each per month	112
6	to help in knitting etc. 4 of them getting Rs. 32 each per month, and 2 of them Rs. 17 each per month	162
3	to nail the pickers Rs. 41 each per month	123
4	to even out the shape (khunā Bhāngār) Rs. 28 each per month	112
3	for punching the pickers Rs. 30 each per month	90
2	for handling drilling operations Rs. 30 each per month	60
2	for finishing (giving final shape by using knives) Rs. 20 each per month	40
2	'Dhāri dabāvnār (to press the ends) Rs. 19 each per month	38
5	for packing Rs. 20 each per month	40
2	'farmāvāllā', Rs. 30 each per month	60
3	for washing the hides Rs. 30 each per month	90
1	for fetching water Rs. 25 per month	25
1	for cart driving Rs. 55 per month	25
4	members of clerical staff ('Misi' Staff)	155
51	Total	1600

From 1 kodi hides about 8 gross pickers are manufactured and per gross these better quality pickers fetched Rs. 34. Hence 200 gross pickers manufactured during that month had brought Rs. 6800 as sale proceeds. Leaving the net profit of about Rs. 500 to be distributed between the two partners.

As regards the processes first the dry buffalo hides are soaked in water. Then the paste of chemicals (lime, sodium sulphate, etc.) is applied for dehairing the hides. Then the hides are cut into pieces of suitable sizes called 'pharmā', which are then roughly shaped and pressed for the first time. After three times pressing them in this way, they are finally knitted, punched, and then dipped in sperm oil for about 2 months. Thus after 3 months the pickers are ready for sale in the market.

For pickers manufacturing good quality hide of slaughtered cattle is preferred to the inferior quality hide of the dead ones. As the population in Gujarat is mainly vegetarian, slaughter houses are not available in the province of adequate size from where buffalo hides can be purchased by the pickers manufacturers. They, therefore, purchase the buffalo hides from the United Provinces, the Punjab, and the North West Frontier Province. The Punjab buffalo is more sturdy, its hide is more thick and hence weighs more, and better pickers can be manufactured from it. The season for the purchase of the hides lasts from March to May as more cattle die during the summer, while monsoon is a very slack season. Monsoon is also a very slack season for the production of pickers as well as their sales.

The pickers manufacturers practically close their kārkhānās for four months of the rainy season when the labourers go to their respective villages and occupy themselves in farming operations. They return to Ahmedabad as soon as the monsoon is over. Even though, they are paid per month, their wages are counted on piece work.

About 30 percent of the productions of Ahmedabad pickers find a local market. Cotton mills, jute mills and silk mills require pickers. In the textile mills one pair of pickers is required per loom and the average life of a picker is about a month. It is surprising to note that 70 per cent of the production of Ahmedabad 'kārkhānās' find markets in other provinces like U. P. and C. P.; while every year Ahmedabad itself imports considerable quantity of English pickers.

Another interesting point which drew our attention was that for about ¾th of their production, the Ahmedabad pickers manufacturers had direct dealings with the Indian Mills; while only ¼th of their production was sold to the Mill Gin Stores Suppliers. Upcountry trade is facilitated by the Demand Drafts sent through the banks, and, generally 45 days' credit is given to the upcountry customers. Otherwise if these customers purchase on cash, 1½ per cent discount is given to them on their purchases.

These indigenous manufacturers feel severe competition of the foreign pickers. Millowners have their own Mill Gin Stores Suppliers who happen to be their relations. Instead of, therefore, ordering their requirements from the local pickers manufacturers, they favour the Mill Gin Stores Suppliers. These suppliers get good commission on sales from the foreign manufacturers, and, they are able to give good commssion to the party giving order on behalf of any mill. If, therefore, the imports of the foreign pickers are stopped this industry will show considerable expansion.

The mill magnets, however, complain about the inferior quality of the indigenous pickers. English pickers are of even size, superior in quality and more durable. They, therefore, insist that local manufacturers should improve the quality of their pickers, and adhere to some standard.

The complain of the millowners is to a certain extent just. All the pickers manufacturers at Ahmedabad are eager to know and study the equipment, processes, etc., pursued in foreign factories. If they get guidance from the Department of Industries, they require (1) a Roll to press the hides for making it even in size and (2) a Press to cut the hides into even pieces. If such technical guidance is given to them with modern equipment in use, they are quite confident of ousting the foreign imports from the Indian markets. Failing this, they urge for the imposition of prohibitive duties on foreign pickers, or else, increment of duties on the exports of raw hides, so that raw hides be available to them at cheaper rates.

The future is bright and promising for this industry. Ahmedabad is the only pickers manufacturing centre in the Bombay Presidency or in the whole of Gujarat. The 'kārkhāndārs' themselves are well off and they are ready to incorporate all the suggestions made to them by proper authorities in connection with the technique or processes. They are prepared to spend for the published literature on this industry, if it is made available to them. Hence, active interest of the State will uplift this industry very quickly and expand and develop its markets.

One Association or the Sales Organization of the pickers manufacturers shall have to be established at Ahmedabad, that can lay down the rules and the regulations to be observed by the pickers manufacturers. Instead of selling the mixed quality pickers, sorting of different qualities and grades should be enforced immediately. Shoulder pickers* are not at all of good quality, hence they should not be put in the markets at all; while, as they are impatient to sell the goods quickly, the pickers manufacturers do not allow the pickers to mature properly by allowing them to remain in sperm oil for six months. More improvement is thus possible by enforcing some rules for the strict observation of these ‘ kārkhāndārs ’.

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* Pickers made from the hides covering the shoulders of the cattle. Such pickers are bound to be of inferior quality because of the uneven thickness of the hide.

WASHERS MANUFACTURING*

Washers manufacturing is one of the important leather industries of Gujarat. In its hey-day it gave employment to about 2000 tanners' families; for the tanned hide was the principal raw material from which washers were made. Broach happens to be the pioneer centre where this industry was established in 1900. By about 1907, this industry was established at Nadiad by Sjt. Hirabhai Kalyanbhai and later on it came to be established at Kadi and Cambay.

Washers manufacturers at all these centres prepared washers from tanned hides and sold them to the ginning factories and mill gin store suppliers. All the cotton gins require washers for their rolls to press the cotton pods and separate the cotton and the seeds. As cotton is grown on an extensive scale in Gujarat, there is a considerable demand for the washers within the province itself.

But with the passage of time, it is reported that the tanners began to apply more salt to the tanned hides. For want of proper organization this malpractice on their part could not be checked in time. By adding salt the tanners could increase the weight of the tanned hide, and as these tanned hides were purchased on weight the washers manufacturers found that they were cheated by the tanners on a considerable scale. Tanned hides being the principal raw material, they had to purchase them more and more with this artificial increase in weight, and hence, it had become well-nigh impossible for them, to compete with the Madras and other foreign leather washers, because they could not afford to sell at the competitive rates. When they were thus handicapped a great deal in working out their industry, after the last "World War", they found that the Madras factories had begun to use the chrome wastage pieces ('bakhhi') for the preparation of the leather washers and it worked out very cheaply.

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* In our investigations we are highly indebted to Mr. Chimanlal C. Narkhi, the indefatigable Social Worker of the Kaira District, for his valuable suggestions, and also for putting us into touch with the Tanners, as well as the Washers Manufacturers of Nadiad.

After 1926 the Nadiad Karkhandars began to import American chrome wastage at Nadiad, and Broach Karkhandars also followed their example. They thus substituted the chrome wastage in place of the tanned hides, which they hitherto were in the habit of purchasing from the tanners. This curtailed the market for the tanned hides a great deal, and affected the tanners adversely, but as far as the washers manufacturing was concerned, it definitely gave a fillip to the industry. The sale of chrome composite washers continued to increase on an extensive scale, with the result that this industry flourished both at Nadiad as well as at Broach.

But the tanners at Kadi* who used to make washers from the 'deshi' tanned hides were hard hit. Gradually they lost their control over the markets, for the washers made from 'deshi' tanned hides were costly when compared to those made from the chrome wastage, and eventually by about 1933 washers manufacturing practically died out at this centre.

Cambay was, however, able to hold its own. Even at present the Cambay Karkhandars use 'deshi' tanned hides rather than American chrome wastage. But the demand for their washers from these tanned hides has been much more curtailed. Hence many of the tanners who used to make washers from 'deshi' tanned hides have given it up†.

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*(2) Chamar Sadha Jaga, (2) Chamar Lala Kana, (3) Chamar Dahya Kana, (4) Chamar Naran Kana, (5) Chamar Ganpat Lallu, (6) Chamar Ganesh Punja, (7) Chamar Jetha Sundar, these were the artisans who made washers from tanned hides at Kadi.

Most of the ginning factories which formerly made use of these indigenous tanned hide washers have now favoured the use of chrome composite washers made out of the American chrome wastage. The existing washers manufacturing centres of Gujarat, together with the Karkhanas and the persons employed by them are represented in the following table :

Centres	*Karkhanas*	*Persons employed*
Nadiad	3	188
Broach	2	60
Cambay	2	40
Total	77	288

Their annual output is estimated as under :

Centres	*Annual output of Washers*
Nadiad	Rs. 1,50,000
Broach	Rs. 75,000
Cambay	Rs. 45,000
Total	Rs. 2,70,000

CHROME COMPOSITE WASHERS MANUFACTURING

As already pointed out, Nadiad and Broach are the only centres in Gujarat where washers are prepared from the American chrome wastage. One of the karkhandars when interviewed at his workshop at Nadiad informed us that he employed 74 persons, most of whom were paid on piece rate. These persons had first to sort out the wastage pieces, then clean and paste them with the gum ('Lai') and afterwards, forward them to the artisans in the Karkhana who would sew, stick and cut them into the required shape.

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†In the beginning when this industry came to be established at Cambay, that is by about 1926, (1) Chamar Bhikha Kesbav, (2) Chamar Vira Ganesh, (3) Chamar Dhana Dahya, (4) Chamar Dudha Kana, (5) Chamar Bhana Kala and (6) Chamar Trikam Jiva used to make washers from tanned hides at Cambay. But now only (7) Chamar Bhika Keshav and (2) Chamar Vira Ganesh are manufacturing the washers at Cambay. Others have wound up their business in this connection.

The equipment of the Karkhandar consisted of Singer Sewing Machines, an Electric Motor, a Press, 'Farmas', 'Rampis' and Dies, in all worth Rs. 3,840.*

He required during the previous year :

Rs.	
36,500	Chrome wastage (Rs. 27,500 for chrome wastage 250 tons, plus Rs. 11,000 customs duties and railway freight he paid for the same).
2,348	'Mendo', thread, needles, wire bundles, cloths for packing, etc.
350	Depreciation charges for the machinery.
30	'Farmas'.
250	Municipal tax he had to pay on the import of chrome wastage as well as the export of washers, Re. 0-1-0 per maund.
100	Fuel (fire-wood)
500	Travelling Expenditure
200	Loss by way of bad debt
600	Workshop and Office rent per year
600	Electric charges incurred
1,800	9 per cent interest charges on the capital borrowed
7,000	Labour charges on piece rate.
50,278	Total

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*Singer Sewing Machines Rs. 2,800 (2) Electric Motor Rs 200 (3) Press Rs. 400 (4) Dies in stock Rs 400 (5) 'Farmas' every year he required about Rs. 30 worth, (6) 'Rampis' in stock with him were worth Rs. 10.

In all he thus incurred an expenditure of Rs. 50,278. He could prepare 1,20,000 ratal washers from the above raw materials[‡] and sold them at Re. 0-6-6 to Rs. 0-6-9 per ratal. His total sale proceeds were Rs. 50,000.

However, about Rs. 5,500 worth chrome and Rs. 500 worth pasting material hàd remained in balance with him at the end of the year. By, therefore, investing the capital to the extent of Rs. 50,000/-, he earned about Rs. 600/- net, which included his labour and supervision charges.

Washers making usually starts from October to April (Bhādrapad to Mahā), while the brisk season for the sales of the washers is the ginning season which begins in right earnest from January and continues its activities up to April, and at times up to May.

Markets for the Gujarat Washers are provincial as well as inter-provincial. The main markets for Gujarat manufactures in this connection are Khandesh, Central Provinces, Berar and Nizam Dominions.[*] Some exports even continue to Africa and Rangoon.[§] Mostly in the inter-provincial markets the Mill and Gin Stores Suppliers are their customers, and to these, Mill Gin Stores Suppliers, (their upcountry customers), they give two months' credit.

Madras is the chief competitor of the Gujarat washers in the above markets ; while the Punjab and the Northern

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[‡] His account sheets further classified the raw materials as follows :

Rs. 700	'Mendo' (at Rs 13 per "gun" which meant 4¾ maunds)
Rs. 928	Thread ('Dora' at Re. 1-1-0 per lb, calico).
Rs. 150	Needles plus Singer Machine parts
Rs. 70	Wire bundles (at Rs. 14 per cwt.)
Rs. 500	Cloth for packing, as they gave station delivery.
Rs. 2,348	Total

[*] Other markets are Ahmednagar, Nasik, Sholapur, etc.

[§] Exports to Burma have practically ceased after the Japanese occupation of that territory.

India markets favour mostly the foreign coir-washers. In the opinion of the Gujarat Kārkhāndārs, Madras is able to have an upperhand in the inter-provincial markets because some quantity of the chrome wastage (which happens to be the principal raw material in washers manufacturing) is locally available to the Madras washers manufacturing concerns from the Madras chrome tanning factories. In the case of the Gujarat Karkhandars, on the other hand, they have to import all their requirements of chrome wastage from America. If, therefore, chrome tanning is developed at some suitable centres in Gujarat, not only the imports of chrome leather will cease, and new avenues for the employment of the tanners will be created, but incidentally, the chrome wastage pieces will be available to these Kārkhāndārs at cheaper rates, for no longer will they be required to bear the customs and railway duties, which *in toto* increase the price of the chrome wastage by more than 30 per cent. They will, therefore, be able to successfully compete with the Madras factories. At present, in absence of the above advantage, the margin of profit from the sales is a bit higher in the case of the Madras Karkhandars as compared to those of Gujarat.

As for the coir washers imported increasingly in the Punjab and the Northern India markets, they are all foreign products. As they are comparatively cheap, they are able to gain preference in the Northern India markets, where perhaps the special quality cotton is also a point in favour of the use of coir washers.

From the point of view of price, coir washers are available at 66 per cent. lower price when compared to the chrome composite washers. Moreover, even if they are not so durable as the chrome wastage washers, when both the price as well as durability factors are taken into account, the balance weighs slightly in favour of the use of the coir washers, for chrome washers last for about 3 months, while the coir washers last for more than a month. Coir washers also seem to suit better the needs of the Northern India factories.

But, in order to give a fillip to our indigenous industry, it is desirable to impose heavy duties on the foreign imports. This will not only widen the markets for our indigenous leather washers but, incidentally, will also create a more favourable ground for the establishment of the coir washers manufacturing industry in India.

Another difficulty of the Gujarat Karkhandars is of getting financed at a reasonable rate of interest. Almost all the Karkhandars have to borrow a substantial portion of their requirement from the indigenous shroffs, who at present charge them as high as 9 per cent interest. Hence they require some banking facilities that can provide them with money at cheaper rates.

INDIGENOUS TANNED HIDES WASHERS MANUFACTURING

As already noted Cambay is the only centre in Gujarat at present occupied in preparing washers from tanned hides.

The process of manufacture of washers from the 'deshi' tanned hides is the same as is prevalent in manufacturing the chrome composite washers at Nadiad and Broach. But the washers made from the tanned hides are dearer than those made from the chrome wastage. When the chrome composite washers are sold at Rs. 10 per maund in the market, the tanned hide washers are sold at Rs. 15 to Rs. 16 per maund. In spite of such a great difference in the price, the Cambay Karkhandars are able to retain some of their old customers because of the superior quality, and hence durability, and more efficient services that their washers render.

The 'deshi' washers, made from the tanned hides last long and bring out more clean cotton seeds. Per 100 maunds of cotton pods, the ginning factories using 'deshi' washers obtain the yield of one maund pure cotton more when compared to the yield they otherwise get by the use of chrome composite washers.

Almost all the Cambay gins at present use these 'deshi' washers. It is reported that in Mr. Bapulal Nanalal's gin at Cambay, about 1935-36, the chrome composite washers were tried, but it was found that in the long run 'deshi' washers were more economical. But the Petlad gin that formerly used to purchase Cambay washers, has now preferred the use of chrome composite washers.

To their credit it must be said that, the Cambay washers manufacturers are able to hold their own because they take extra care to see that (*i*) in the purchase of the tanned hides they are not deceived by the tanners, and (*ii*) the tanned hides which they purchase, are not coated with an unnecessary large quantity of salt which spoils their quality and unduly increases their weight.

Some of the proprietors of the ginning factories, however, reported to us that even though the yield of cotton was more by the use of 'deshi' washers, (as these superior quality washers could better clean the cotton seeds when compared to the chrome composite washers), the cotton made available by the 'deshi' washers suffered in brightness, it appeared pale when compared to the yield of cotton by the use of chrome wastage washers.

This defect is, however, not so grave. If proper steps are taken to improve the quality of the 'deshi' washers (a) by stopping the mal-practices of the tanners on the one hand, and (b) by improving the quality of tanned hides on the other, the above defect will be easily removed. A good organization should be set up by the Government in this connection that can check the malpractices among the tanners and can render expert guidance to them.

This is definitely an urgent requirement of the industry, when it is realised that about Rs. 1,50,000 worth chrome wastage pieces are imported every year in Gujarat by the Nadiad and Broach Karkhandars.

If the orders for the same value are put with the local tanners, about half the amount will go to them by way of labour charges, which means about 600 families with a monthly income of Rs. 10/- will be maintained by this industry, and if their present practice of working as agricultural labourers during the monsoon, is taken into consideration, about 900 families will be maintained by this industry.

With the increasing use of imported leather-like chrome willow-calf, 'rāni chhāp' patent, etc., and with the increasing imports of foreign boots, shoes and leather articles, the tanners of the province are hard hit. About half the number of these artisans remains unemployed, while the other half is under-employed. Hence any attempt to improve the condition of this industry will result in manifold benefits.

CHAPTER XI

FOOD AND DAIRY INDUSTRIES

(A) FOOD INDUSTRIES

FLOUR GRINDING

As REGARDS the food industries of Gujarat the census figures show us that in all they engage 5803 persons. Out of this number 3,125 persons are engaged in rice grinding, husking and flour grinding, 300 in garin parching, 1440 in sweetmeat and condiments, etc. preparing, 292 in Sugar mollasses and 'gur' making, and, 646 in other food industries. Out of the total 5803 persons engaged in these industries, it should be noted that 2407 are females.

In the by-gone days, rice grinding, paddy husking, and, grain parching were the important rural handicrafts, and they constituted a very important subsidiary occupation to the cultivators of Gujarat. But the rise and growth of rice and pulse polishing concerns in Gujarat has now resulted in the elimination of these handicrafts and most of the paddy husking and pulse making is now done by machines.

Among the food industries, more important industry (from the point of view of its size) is flour grinding. Even today it is both a rural as well as an urban industry. In the past, it existed as a handicraft, and, it was a principal source of income to the females of the poor and the lower middle classes. Those females (especially the widows of the forward communities), who could not work in the open field, owing to the prevalence of the 'purdāh' system, found a very convenient source of employment in this industry. But, now a days, flour mills have usurped in a marked degree, this important means of their livelihood in the urban areas. Practically every small town of Gujarat has a flour mill. At present in Gujarat, there are more than 300* flour mills, and, they are showing the tendency to fast multiply their number.

Most of these flour mills, are unregistered factories. Some of them are run by electricity, while most of them by oil. With the help of machinery they are able to grind the flour at a very cheap rate. Hence the flour mills have also made their appearance in some of the big villages of Gujarat. In the ordinary course, for grinding one maund grain annas 8/- are charged by the hand-grinders, while the flour mills charge only annas 3/- for the same quantity. Under the circumstances the hand-grinders of the villages demand the total stoppage of the operation of the flour mills from at least the rural areas. In rural areas, excluding the requirement of agriculture, other sources of employment are very limited, and flour grinding is one of the important occupations of the females. Their demand, therefore, deserves sympathetic consideration of the social thinkers.

From among these flour mills there are 5 Roller Flour Mills† in Gujarat employing in all 238 persons. But these roller flour mills are feeling severe competition from the roller flour mills of Bhatinda, Ludhiana, Ujjain, Indore, etc.

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* From our inquiry we have gathered the following information about the number of flour mills existing at the various centres of Gujarat. British Gujarat:—Sarkhej 2, Anand 6, Kapadvanj 3, Mehmedabad 3, Karamsad 3, Borsad 3, Umreth 7, Bhalej 2, Vadtal 2, Uttarsanda 3, Broach 7, Jambusar 4, Ankleshwar 4, Amod 6, Hansot 3, Kolak 2, Godhra 20, Jhalod 4, Limbdi 1, Dahod 12, Mandvi 3, Rander 4, Bardoli 4, Valod 7, Udwada 2, Vapi 6, Pardi 4, Jalalpure Mahal 15, Bulsar 14, Chikhli 4,; Baroda State;—Mehsana 3, Patan 5. Visnagar 3, Sidhpur 1, Dabhoi 5, Manund Road 2. Vyara 2, Savli 1, Navsari 3, Kamrej 2, Songadh 1, Gandevi 1, Lunawada 1, Rajpipla 5, Radhanpur State 3, Palanpur State 13, Idar State 5, Santrampur State 2

† Roller Flour Mills at Ahmedabad—3
Roller Flour Mills in Broach and Panch Mahals—2

As a result, the Roller Flour Mills of Godhra with a capacity of grinding 280 bags of gram per day is closed down.

Half of the production of the three Roller Flour Mills of Ahmedabad is practically consumed locally. But, the other half finds markets in the big towns of Gujarat like Baroda, Broach, Surat, Bulsar, etc., where wagons loaded with wheat flour and grain flour arrive every month from Bhatinda, Ujjain, etc.

These Roller Mills from the Indian States successfully compete with the Gujarat Mills, in the Bombay as well as Gujarat markets. It is so, because, they find the prices of wheat and gram comparatively cheap in their State areas. Moreover, labour is also comparatively cheap in their States and they obtain long distance concession in railway freights from the B. B. & C. I. Railway.

B. B. & C. I. RAILWAY FREIGHT RATES

	Dahod to Bombay Distance 330 miles	Ujjain to Bombay Distance 425 miles	Bhatinda to Bombay Distance 900 miles
Rate charged per maund	Re. 0-10-5	Re. 0-10-5	Re. 0-14-0

Under the circumstances, the Dahod's Govind Roller Flour Mills, Co. Ltd. has to purchase wheat and gram at comparatively high rates, grind the same at Dahod, and export the flour to Bombay. There is every likelihood of this Roller Mill being closed down in the near future. If, therefore, the long distance railway concession remains in favour of the Northern India Mills, Roller Mills have great future either (*i*) in the Punjab, where the raw materials wheat and gram, as well as labour, are comparatively cheap; or (*ii*) at Karachi, from where the flour can be exported *via* sea at cheap rate (Re. 0-3-4 per maund) to Bombay.

PADDY HUSKING AND GRAIN PARCHING

Rice does not play any important part among the cultivation of crops in Gujarat. Hence we find comparatively small number of Rice Mills in Gujarat. Even though there are more than 125 rice mills* in Gujarat, we find that more than half of these small unregistered factories are having Flour Mills and Rice Mills combined plants.

The present number of persons engaged in rice grinding, husking and flour grinding is only 3,125 in Gujarat. Before the introduction of machinery in these food industries, there must be comparatively a very large number; but the number is bound to still decline with the growing number of Flour Mills, Rice Mills, and the introduction of the Rice Hullers in this region.

Paddy husking and Rice grinding handicrafts have, therefore, fast declined during the last two decades, and the same is the condition of grain parching.

Pulse-Making is also an important rural handicraft of Gujarat. Because of its 'tuwer' crop the Golas of Gujarat used to keep 'Dalkharis' (pulse-making handmills) in their houses, and as soon as the monsoon was over, they engaged themselves in pulse making.

However, the number of 'dalkhari' owners is fast declining. According to the census figures the total number of persons engaged in grain parching in Gujarat is hardly 300.

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* Number of Rice Mills at the various centres of Gujarat is given below: Ahmedabad Rice and Pulse Mills 1, Karamsad (F & R) 3, Umreth (F & R) 7, Anand (F & R) 2, Kapadvanj (F & R) 3, Amod (F & R) 1, Ankleshwar 2, Hansot (F & R) 3, Godhra (F & R) 2, Jhalod (F & R) 4, Surat 4, Bardoli (F & R) 4, Valod 6, Kolak (F & R) 2, Vapi (F & R) 5, Pardi (F & R) 4, Jalalpore Mahal 9, Bulsar 10 plus (F & R) 4, Chikhli (F. O & R) 4, Billimora 4, Kamrej 2, Vyara 1, Navsari 1, Vaghodia 3, Jarad 1, Dabhoi (F & R) 1, Bansda State 2, Lunawada (F & R) 1, Santrampur (F & R) 2, Rajpipla (F & R) 23. (N. B. F = Flour Mill; R = Rice Mill; O = Oil Mill; F & R = Flour and Rice Mills' combined plants; F O, & R = Flour, Oil and Rice Mills' combined plants.)

For pulse making on handicraft basis, except Jambusar, Degam and Anand, there is hardly any other centre worth mentioning in Gujarat. With the introduction of machinery in this industry, the number of 'dalkhari' owners is fast declining,* for, machine-made 'dal' is cheaper than hand-made 'dal'.

There are in Gujarat more than 30 pulse-making and pulse-polishing (or dal or pulse-splitting) Mills‡. These are very small unregistered factories, and, with the establishment of a few more Pulse-making Mills, the 'dalkhari' handicraft will practically die out from Gujarat.†

OIL INDUSTRY

Oil is one of the important items of food of the people of this region. Sesamum oil is preferred by them to ground nut oil. Hence mostly the 'ghanis' in Gujarat crush sesamum or ground nuts, but on Surat side they also engage themselves in crushing 'kharsani', while in Panch Mahals, because of the availability of mahura trees, they crush mahura seeds (doli). Only a few 'ghanis' crush castor seeds in Gujarat.

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*In our survey we were informed that there were 25 'dalkhari' owners at Ankleshwar, but at present all of them are rendered unemployed because of the establishment of a Pulse Mill. There were 10 'dalkhari' owners at Degam, but their number began to decline from 1922 onwards, with a result that today there are only 3 dalkhari owners. Jambusar is, however, holding its own and 35 families are engaged in splitting 'dal' by hand. It is so because, it is in the interior, and as yet no Pulse Making concern is established at this centre

‡Ahmedabad (Rice and Pulse Mills) 1, Anand 2, Ankleshwar 1, Umreth 2, Dahod 3, Surat 5, Bulsar 9, Pardi 1, Amalsad 2, Sidhpur (oil and Pulse Mills) 1.

† It is reported that about 1000 golas were engaged in the dalkhari handicraft in Gujarat. Golas of Surat, Kaira, Broach and Panch Mahals were very happy in those days. But (*i*) imports of machine-made 'dal' and later on (*ii*) the introduction of this plant at the various centres of Gujarat, deprived them of their important source of income and most of them are now selling 'pān', 'bidis', serving in 'hotels', or remaining unemployed.

Upto the beginning of the 20th century oil-extracting was a handicraft in Gujarat. Practically all the 'ghanchis' of Gujarat used to own bullock driven 'ghānis', or, oil extracting equipments. But the oil mills came to be established first in the big cities of India, like Bombay and Ahmedabad, and later on with the rise and growth of this industry on machine basis, they came to be established in the small towns of Gujarat.

Oilseeds form one of the principal agricultural crops of Gujarat, and as such, the total number of vegetable oil workers in Gujarat is 9,439. However, this number is bound to be great when this industry was having its hey day on handicraft basis.

There are in Gujarat at present, about 150 oil mills.* But it is very difficult to give the estimate of the oil crushing ghanis. Most of the above oil mills are small unregistered factories. For, out of the 80 oil mills of the British Gujarat, mentioned in the following footnote, only 26 are registered factories employing in all 1185 persons.

According to the ghani owners of Surat, before the last World War, ground nut oil tins used to be imported in Gujarat from Madras and other centres. But, as transportation, packing etc., took time, this oil used to deteriorate in taste, before it reached to the consumer. Realising the difficulties in selling this imported oil, the entrepreneur of Gujarat began to establish oil mills at the various centres.

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*Ahmedabad 13, Nadiad 1, Anand 3, Kapadvanj 6, Umreth 5, Thasra 1, Kathlal 1, Uttarsanda 1, Ankleshwar 2, Vejalpur 3, Derol 4. Godhra 3, Jhalod 1, Dahod 6, Surat 8, Olpad 1, Valod Mahal 6, Udwada 1, Vapi 3, Pardi Mahal 2, Vijalpore 1, Amalsad 1, Bulsar 4 plus (F.M.,R.M. and O.M.) 2, Chikhli (F.M.,R.M. and O.M.) 4, Baroda 2, Karajam 1, Kadi 2, Kalol 1, Unjha 1, Navagam 1, Bhawar 1, Sidhpur 3, Dabhoi 3, Vaghodia 3, Navsari 4, Billimora 5, Vyara 1, Songadh 1, Mehsana 2, Himatnagar 1, Rajpipla 1, Unani 1. (*N.B.* F.M., R.M. and O.M. means Flour, Rice, and Oil Mills' combined plant.)

They began to crush the ground nuts, and, with the fresh ground nut oil they began to mix sesamum oil, and they passed on this mixed oil, as pure sesamum oil, to the consumers. When the price of sesamum oil is Rs. 12–0–0 per Bengali maund, that of ground nut oil is usually Rs. 7–8–0. The difference in the price being substantial, they could earn more by this mal-practice. This their trade secret was ultimately found out by the oil crushing ghani owners; and they also began to resort to the same mal-practice.

Still, however, as the machine has always an advantage over hand, mill oil is usually sold at 8 to 12 annas' difference per maund. Hence the oil crushing ghanis are simply marking time for their extinction. In the villages remote from the railways (where cart transport plays important role for carrying goods or passengers) this handicraft, being to a certain extent immune from machine competition, will exist due to the protection afforded to it by its geographical location. But, the moment swifter means of communications link up such centres with the outside world, this handicraft will lose a great deal of its importance.*

Present important oil, crushing centres of Gujarat are

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*Decline of oil crushing ghanis can be easily gauged from the following information given by the ' ghani ' owners of the various centres of Gujarat.

Centre	Number of ghanis in the year 1922-23	Number of ghanis at present
Surat	225	150
Bulsar	60	14
Vyara	12	1
Santrampur	40	30
Rajpipla	40	9
Cambay	60	17
Himatnagar	20	3
Radhanpur	50	5
Palanpur	70	30
Modasa	100	50

Surat, Patan, Godhra, Baroda, Modasa, Idar, Dahod, Palanpur, Santrampur and Umreth.

From among these centres, the leading centre of Gujarat is Surat, where about 150 ghanis are working at present. Surat ghani owners themselves purchase oilseeds, crush them and run their shops to sell oil to the consumers. Their investment in the oilseeds comes to Rs. 40000 to 50000/- per year. They purchase sesamum, as well as ground nut or 'kharsani' in a lot of 15 to 20 maunds, and usually they invest about Rs. 200 at a time, in oilseeds. Looking to their brother 'ghanchis' in the villages of Gujarat, their lot is better. They earn Rs. 25-30 per month. Earning of an average ghanchi in other important centres of Gujarat, like Bulsar, Modasa, Godhra, etc. is Rs. 15 to 20 per month, while the 'ghanchis' in small villages hardly earn Rs. 7 to 12. Some of them do not find sufficient market for their goods, hence during the monsoon they attend the field. For the majority of the ghanchis in Gujarat's villages some such side occupation has become a necessity.

BAKERIES

In Gujarat's every big town, we usually find two or three small bakeries. Their number swells in the case of big towns or cities. Hence, Ahmedabad, Baroda and Surat top the list of the centres, which claim of greater number of bakeries in Gujarat. Most of these bakeries make bread (or 'double roti'). They require wheat flour, sugar, vegetable ghee, ground nut oil, butter and salt, for making bread. With simple equipment like pans, bread pans, tables, and an oven, in all worth Rs. 250-75, by employing some labourers, who are usually paid Rs. 15-20 per month, and with the investment at the most of Rs. 1000/- these bakery owners earn Rs. 60-70 per month, among these bakeries, there are some big bakeries, who employ more manual labour, and earn more remuneration. But in the small towns of Gujarat, the average income of a bakery owner is a bit low and it comes to Rs. 40–50 per month. Mostly these bakeries meet the local requirements, and as such no special suggestions can be made to develop their further growth.

The number of bakeries engaged in making biscuits, cakes, and, 'nankhatai', is comparatively very small. Hardly 75 such concerns* might be existing in Gujarat.

For making bread the following process is resorted to by the bread-makers :—(*i*) doughing, (*ii*) kneading, (*iii*) formenting, (*iv*) dividing (cutting the loaf into pieces), (*v*) rolling (shaping), (*vi*) fermenting (by allowing some time), (vii) baking and (viii) finishing.

For making the biscuits, the process differs a great deal. Right from the beginning to the finish they adopt the following procedure :—(*i*) mixing, (*ii*) stirring, (*iii*) rolling (cutting), (*iv*) panning, and, (*v*) baking. Moreover, special biscuit cutters are used by the manufacturers, and, they also require 'menda' flour in making biscuits.

In their items of expenditure fuel plays an important role, while (*i*) municipal tax, (*ii*) shop rent, (*iii*) wages, extra labour charges like feeding the labourers (as it is customary to do so) and, (*iv*) the standing expenditure of baskets and a cycle, are the other items of their expenditure.

Usually in these biscuits, cakes, and 'nankhatai' manufacturing concerns, the proprietors invest Rs. 2000/- and they earn Rs. 100–125 per month. But this their earning includes the interest on their investment plus (*i*) labour, (*ii*) supervision and (*iii*) management charges.

For certain processes of bread and cake manufacturing, rainy season is not quite suitable. But, as it is not possible to stock the goods for months together, such difficulties are overcome by extra care and precaution.

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*There are 10 such bakeries at Surat, 10 at Ahmedabad, 9 at Broach, 7 at Baroda, 6 at Bulsar and 2 at Udwada.

Breads are sold in dozens (the price quoted is per dozen breads), while biscuits in lbs. Local competition in rate among the manufacturers often takes place in a big city like Ahmedabad, but this can be avoided by establishing their Association.

At present Gujarat badly needs a few big bakeries to manufacture high class biscuits, as in their absence, better quality biscuits are imported from other parts of the country and from the foreign countries as well.

It should be noted here, that the masses usually do not care for the quality of breads, cakes, biscuits or sweetmeats. Usually they are inclined to buy the cheap stuff. Hence the manufacturers are obliged to use the most inferior ingredients. Foreign ingredients like vegetable ghee and artificial butter are available in our markets and their prices are comparatively low. There is, therefore, an urgent need for a strict watch, and minute inspection of the materials (stuff) used by the biscuit and sweetmeat makers. The food stuffs manufactured by them affect the public health, hence, the Government Medical Inspector should inspect them every now and then by surprise visits. The State should also make it obligatory for the public to purchase their needs from only the licensed or certified manufacturers and dealers.

Imports of foreign biscuits need be stopped and the Associations of the (*i*) Bakery owners, and (*ii*) Sweetmeat makers should be established in order to formulate rules and regulations for the strict observance of their members.

With the proper State supervision and guidance, it will not be difficult to manufacture standard biscuits in Gujarat which can compare well with the foreign biscuits as for their quality that is (*i*) stuff, (*ii*) taste, and (*iii*) shape.

GUR MAKING

Because of more rainfall, in the South Gujarat the agriculturists cultivate sugar cane crop. But gur making or sugar making is not a very prominent industry of Gujarat. The census figures show us that only 292 persons are engaged in this industry in the region.

Important centres of gur making industry of Gujarat are Gandevi, Billimora, Bulsar, Amalsad, Atgam, Muli, Vaghchhippa and Vyara. To her credit it should be pointed out that Gujarat's gur is considered to be the best quality gur 'Tarabado gol' and that Gandevi merchants have still preserved their trade reputation.

The number of persons engaged in gur making must have been comparatively large in the past, when it is realised that now power crushers are increasingly used in gur making. Moreover, inferior quality gur from other parts of India has also made heavy inroads in Gujarat markets and this has adversely affected the price of the better quality Gujarat gur, with a result that there is no added impetus left for the peasants to take to sugar cane cultivation. Gujarat farmers are not so enthusiastic about increasing the acreage for sugar cane cultivation, because in case of rain failure, there is lack of adequate irrigation projects in the province.

At present about 2500* acres land is under the cultivation of sugar cane in Gujarat. Per acre yield of gur varies from 30 to 50 Bengali maunds. Hence Gujarat's total annual production of gur can easily be said to be of 80,000 to 1,00,000 Bengali maunds.

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*600 acres in Pardi Taluka, 600 acres in Bulsar Taluka, 300 acres in Chikhli Mahal, 500 acres in Jalalpore Taluka and 500 acres in the rest of Gujarat.

This estimate we have obtained from our personal inquiry from the enlightened sugar cane cultivators of the various areas.

But the cultivation of sugar cane is done by the agriculturists in a haphazard manner. They usually devote only a small portion of their lands to sugar cane cultivation. What is, therefore, needed is the plantation of sugar cane over a huge area, in order to make Gujarat self-sufficient for her requirements of gur. This will also result in the well being of the peasants.

The extraction capacity of the crushers by power varies from 65 percent to 70 percent, and that of the non-power crusher is about 62 per cent. Naturally, this important subsidiary occupation of South Gujarat's cultivators is, therefore, suffering elimination at the hands of the factory.

Because of the existence of gur making industry, there has also come into existence sugar making industry in this province. But this is done on a very small scale and by a few unregistered small factories in Gujarat. They make sugar out of gur and sell it in the local markets. These are seasonal factories and they are found hardly working for more than 4 months in a year. Theirs is still a very limited number, and they are found in the following centres:—Ahmedabad 7, Ankleshwar 6, Surat 3, Bulsar 1, Nadiad 2, Amalsad 1, Viramgam 1, Gandevi 1. But the last one at Gandevi is a sugar works employing 71 persons. It is the biggest factory from among this list. Gur making industry is rightly known as 'vādalio udyog', that is, it is the industry depending on cloud (that is on rain). If per acre yield of crop is good, and, the output of gur in other parts of India is less, the peasants earn some profit; otherwise, this industry hardly yields them good margin. But this is an industry which definitely has good scope for development in the South Gujarat. What is needed in this connection is the active State interest and scientific investigations to explore the possibilities for its further growth. Unless the industry is put on a sounder and surer footing, it is likely to suffer a great deal in future, for it is mainly in the hands of poor and illiterate farmers.

MARINE RESOURCES*: FISHING

So far fishing is neglected on the Gujarat coast and it remains in the hands of Machhies and Kharvas who are illiterate and follow their age old methods. It is so because, majority of Gujaratis are vegetarians and do not eat fish. According to the census of 1931, 8030 workers are engaged in fishing and pearling in Gujarat. As pearling is an insignificant industry, all these workers may be presumed to do fishing and allied work. However, from among these workers 3477 are females who carry fish to the local market and sell them. The important areas in Gujarat, where this industry is carried on, to-gether with the number of workers engaged therein are as follows :

Surat District	1,465
Navsari District	773
Broach District	489

As Gujarat is favoured by broken coastline, every river mouth affords a good creek, and, a roadstead, where mainly the fishermen dwell and carry on fishing along the Gujarat's coast.

Main centres of Gujarat, where fishing is carried on, are Cambay, Sarod, Kavi, Tankara, Jambusar, Kolak, Sajod, Hansot, Olpad, Bhagwa, Maroli, Jalalpore, Navsari, Bulsar, Matwad and Dandi.

Fishing is mainly a seasonal industry, the brisk season being from September to April. This industry is mainly in the hands of independent fishermen in Gujarat. Their nets are worth Rs. 15 to 20 each, and they themselves usually prepare them from jute thread, purchased locally at Rs. 4 to 6 per maund.

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*Marine Resources of Gujarat require a separate study, as such, we have made reference to these resources in Chapter XII and XIII, while referring to the possibilities of establishing more salt works, alkali works, cement works etc. in Gujarat.

In some centres the fisherman works in cooperation with brother fisherman. Thus five to six fishermen work on a boat, and the owner of the boat is paid a share of the day's catch. The fish thus gathered is sold by the fisherman's wife in the local fish market. At many places the fish is bartered for grain. On an average a fisherman earns about Rs. 5 to Rs. 10 per month. In the farther interior, Bhils, Kharvas, Machhis and other tribes catch the river fish by adopting age old crude methods.

On the Gujarat coast, it can be said that, though there are many fishing centres, they are smaller in size and less important, when compared to those of the other parts of India.

Gujarat coast owns the following fisheries of great economic importance :–1 Shark and its relatives, 2 Bombay Duck, 3 Pompret, 4 Hilsa with its relative Clupeatoli and 5 the Jewfish. But the Shark fishery in the Gulf of Cambay is of inferior quality.

According to the fishermen of these centres they catch among big fish: 'pālvā', 'chaksi', 'nar', 'modār', 'gol', 'bumlā', 'dādhā', and among small fish : 'sondhiyā', 'jingi', 'fansti', 'jipti' 'sevar', 'gari', 'dhongri' 'cheval', 'doliya', etc.

On Broach and Bulsar coast the river fish or sweet water fish are available and their chief varieties are, 'boi machhi', 'jingā', 'pādhān' 'māl', 'vārsā', 'roi' 'dakvā', 'khādvāri', 'modhiyā', 'māru', 'singārā', 'kachlā'.

*"The Surat district has a good coastline and a substantial section of the population is reported to be non-

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*Information incorporated from the Report of the Bombay Economic and Industrial Survey Committee 1938-40, Volume II, Surat. p. 18.

vegetarian. Conditions are thus favourable for the improvement of the fishing industry, which is carried on to a limited extent at Olpad, Jalalpore, Bulsar and Kolak. The investigator studied the conditions of the industry at Kolak and Bulsar. The number of fishermen at Kolak and Bulsar is reported to be 300 and 20 respectively. At both centres, nets are prepared by the fishermen during the rainy season, from hemp purchased locally. The Kolak fishermen also carry on agriculture. Fishing at Kolak is mostly done on a co-operative basis. There are 29 fishing boats at this centre and generally 10 persons work on a boat. The boats are somewhat costly and are estimated to cost about Rs. 1,000 each. After the day's toil, the catch is equally distributed among the crew, and, the owner of the boat gets an additional share. The Bulsar koli, on the other hand, works by himself. His small boat, worth about Rs. 10, is usually carved out of the stem of a tree.

"The nature of the catch varies according to the season, which starts more or less simultaneously at all fishing centres in the Bombay Province. From October to December the catches of bombils (Bombay duck) are heaviest. From February to May, Ghol (Sciaena sina and S. diacanthus) and Dara (Polynemus indicus) are predominant among the fish caught. The fish caught at Kolak is partly cured and partly sold in the fresh condition. Some part of the catch is sent to nearby areas and to Bulsar. The amount caught at the latter place is barely sufficient to meet the local demand. Fresh fish is generally sold by the womenfolk. The cured fish finds a ready sale at Nasik, Broach and Ahmedabad. The prices obtained last year for this fish varied from Rs. 12 to Rs. 14 per 20 in the case of Ghols, and, from Rs. 18 to Rs. 20 in the case of Dārā. The maws gathered from the larger fish are sold locally to traders at the rate of Rs. 5/8 for 20 maws. They are exported to England and France, where the product is utilised for the manufacture of isinglass. The investigator estimates the monthly income of the kolis at Kolak and Bulsar at Rs. 15 and Rs. 3 respectively during the fishing season.

"The Kolak fishermen complain bitterly about heavy charges they have to pay for salt used in curing fish. It is reported that although Government supplies salt at cencession rates, the whole supply is monopolised by a few middlemen, who charge double the rate. The fishermen, therefore, want a fish curing yard to be established in their centre. They also want to be put into direct touch with the big trader of fish maws from Bombay. This, they believe, would enable them to get more remunerative rates for the maws than at present. A minor grievance of the Bulsar fishermen is the increase in the municipal tax on the sale of fresh fish. Some years back the tax was stated to be only 6 pies a day while to-day it has been increased to one anna. The Bulsar fishermen maintain that even this small increase is too much for people like them and is not justified in view of their petty income of Rs. 3 per month."

It will thus be realised that fish curing yards require to be opened up by the Government at the various fishing centres of Gujarat.

All these fishermen are adicted to drinks and most of them remain always indebted, and, under the clutches of Mohamedan dealers from whom they borrow, and to whom they sell their catch. Their economic condition is far from being satisfactory, and, as fishing is not yet developed on scientific lines, it has not been so paying, and as yet it has not attracted the notice of the intelligentia.

In order to relieve the fishermen from this mill-stone of indebtedness hanging on their necks, it is desirable that the Bombay Government should take steps for opening up Fishermen's Co-operative Banks at suitable centres.

Everywhere there is a useless wastage of marine wealth, and, Mr. James Hornell found in his investigations that "approximately two-thirds of every catch was immature and undersized fish, of sizes far below what any country with organized fishery regulations would permit to be caught or offered for sale. The waste entailed is enormous. Instead of sizeable fish being on sale in the markets, giving good remuneration to the fishermen and satisfaction to the consuming public, complaint is constant of scarcity of fish and of the poor quality of the little that is offered."

"This lamentable State of the industry can be remedied only by prescribing a minimun size of mesh in all nets sufficiently large to permit the escape of the majority of immature fishes, particularly mullets."*

We, therefore, find that fishing industry so far has been neglected on the Gujarat coast by the authorities concerned. If properly developed, fish canning might become a paying proposition, and, in addition, curing of fish-skins and the preparation of good quality fish-meal, fertiliser, and oil might also be favoured in this region. Fisheries are a source of food supply next in importance only to agriculture. Fishery development will, therefore, improve the diet of the masses, and, also confer upon the people, by the introduction of more auxiliary industries and trade, benefits of increased wealth and occupations.

POULTRY FARMING

Poultry farming as an industry has not become very popular in Gujarat. It is so because majority of the population does not take eggs and meat. Most of the Gujaratis are strict vegetarians.

However, because of the greater number of Mohamedans, and, also the residence of the Parsis in the Surat and Broach Districts, we find poultry farming carried on, on a limited scale at Udwada, Navsari, Jalalpore, Surat, Ankleshwar, etc.

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* *Vide* Report on the Marine Fisheries of the Baroda State in 1930 by Mr. James Horaell, F. L. S.

The owner of the Poultry Farm at Ankleshwar informed us that it takes 21 days for the hen, and 28 days for the duck for incubation of eggs in the artificial incubators. The eggs are usually sold at 6 annas a dozen and the birds at Rs. 6 a dozen. The average income of an agriculturist from poultry farming is about Rs. 5 per month.

Eggs are even recommended by the medical officers as the substitute for milk, and, as such, the possibilities offered by this industry, as a subsidiary occupation to the cultivators, are immense.

What is, therefore, needed is an active State effort, and, a good State Research Institute and Demonstration Yard where constant experiments of improving the poultry breed should be carried out. This Institute should also take steps to organise the egg market and issue instructions to the poultry farmers for grading the eggs, etc.

(B) DAIRY INDUSTRIES

GHEE INDUSTRY

Ghee is the staple food of the masses in Gujarat. There are, therefore, many centres known for ghee making in this region. The following table gives us the idea of such wellknown ghee making centres of Gujarat :—

	State or District	*Well-known centres of Ghee Industry*
A.	Kaira District:	(1) Mehmedabad, (2) Mahudha, (3) Kapadwanj, (4) Nadiad, (5) Kathlal, and (6) Borsad.
B.	Baroda State :	(7) Kadi, (8) Dhinoj, (9) Visnagar, (10) Kheralu and (11) Bodeli.
C.	Rest of the Gujarat :	
	(*i*) Balasinor State	(12) Jetholi, (13) Balasinor,
	(*ii*) Radhanpur State	(14) Munjpur, (15) Vadhiyar,
	(*iii*) Idar State	(16) Khed Brahma, and
	(*iv*) Santrampur State	(17) Santrampur.

In the British Gujarat the most important centre of ghee trade is Mehmadabad. Annually about Rs. 2 lakhs worth ghee is exported from here to Surat, Broach and Baroda. Ghee for export is generally purchased by dealers from the agriculturists.

But throughout British Gujarat the public opinion is gaining ground that pure ghee is hardly available in market. Mixing of vegetable ghee with pure ghee, is increasingly resorted to by the ghee merchants, as well as the agriculturists, and, there is an urgent need for State action in this direction.

The Government of India have evolved a scheme for grading and marking of Agricultural Produce of the Government of India, under the Agricultural Produce (Grading and Marking Ghee) Rules, 1938.*

These rules have subsequently been adopted by the Baroda State, and State guaranteed tins, of 40 lbs, 20 lbs, 10 lbs, 7 lbs, 3½ lbs, and of smaller sizes, are filled in by the merchants, and the quality of ghee is graded and marked "Special", "Buffalo", "Cow", and "General" according to the four grades fixed by the Agricultural Marketing Adviser to the Government of India.

Moreover, Baroda State has appointed Special Officers for this purpose for the various Divisions of the State. As a result, centres like Visnagar, Dhinoj and Kheralu are fast gaining importance, and, building up their reputation.

On the other hand, the various centres of British Gujarat are fast losing their importance, for the Bombay Government have so far failed in adopting any bold measure in this direction.

It is a well-known fact that vegetable ghee is made from ground nut oil, and that, it is available in the market at less than half the rate of ghee. It is odourless and tasteless, therefore, when it is mixed up with pure ghee, it catches its smell and taste to a certain degree. In the better interests of this industry as well as the public this mixing has got to be stopped. Hence, the Bombay Government should either adopt the above scheme devised by the Government of India, or else, it should stop the imports of vegetable ghee in British Gujarat.

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* Published under the Government of India Notification No. F 51, (45) 38G—1, dated the 27th October, 1938.

Vegetable ghee is used in making varnishes, and it can be made available by the Government to such varnish manufacturing concerns for bonafide purposes by issuing licenses. But in Gujarat there is hardly any varnish manufacturing concern; hence, over and above for mixing purposes it is used in making bread, biscuits, and sweetmeats.

Bombay Municipality has recently favoured the Vegetable Ghee Producers by allowing them to mix about 10 per cent vegetable ghee with the pure ghee. Once such allowance is made it requires a laborious and expensive machinery to check the extent of adulteration.

Due to this indifferent attitude of the Government of Bombay, British villages of Ghoga Mahal in Kathiawar freely import vegetable ghee, and illicit inroads of this ghee take place in Kathiawar States' markets inspite of the vigilance of the State authorities concerned.

Under the circumstances malpractices, adulteration and illicit trade in this commodity show increasingly upward trend. It is only in this industry that due to malpractices and adulteration principles of economics cannot function properly. For, by selling the raw material (milk) the agriculturists make profit. But, if for the want of market for milk, finished product (ghee) is sold, they lose. Hence the agriculturists themselves have to purchase vegetable ghee, mix it and sell it in the market as pure ghee.

It should, therefore, be realised that till some dairy industry of sufficiently large size (like ghee) does not become a paying proposition, cattle-rearing will remain more or less an economic liability to the Gujarat population.

OTHER DAIRY INDUSTRIES

It should be realised at the outset that in Gujarat there is a very limited number of creameries. They are mainly found in (*i*) Kaira District, (*ii*) the bordering villages of Baroda State, (*iii*) Ahmedabad District, and (*iv*) Cambay State.

Out of these, there are only two registered dairies in Gujarat. One at Ahmedabad employing 44 persons, and, the other at Anand employing 130 persons.*

The Anand factory is daily supplied with 100,000 lbs. of milk by merchants who collect it from the agriculturists. With the help of a milk separating machine, the cream is taken out and kept into pasturizer to kill bacteria. It is kept for a day in condenser and later on transferred to a churner which prepares butter. In the separated milk, acid is mixed, and casein is prepared. Casein pieces are ground in powdering machines and then exported.

The annual production of butter of this factory comes to about 1,302,373 lbs, and that of casein about 3000 maunds. Anand's name is thus connected more with her dairy industry, and especially it is known for the products of Polson Model Dairy.

CREAMERIES

There are in Gujarat in all about a dozen more creameries, the owners of which keep milk separating machines.

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* In addition, there are 14 dairies at Ahmedabad and 3 at Surat mainly devoted to butter making. A few others of this type are also found at Baroda, Broach, etc.

The number of such creameries at the various centres of Gujarat is as follows: 2 at Bhalej, 1 at Mehmadabad, 2 at Kanajari, 1 at Visnagar and about half a dozen more in the Baroda State at centres like Mehsana, Navsari, etc.

These creamery owners keep cream separators (or milk separating machines) worth Rs. 300 and they are usually of 90 gallons capacity. In addition they keep copper 'bamba' and big brass pots to collect milk, copper 'tapelas' (pots) to heat water, and, four or five dozen cans for despatching cream. In addition, they keep weighing scales and measures for purchasing milk, and buckets and lanterns.*

They have to employ a clerk to pack the cans and apply labels, and, in addition, labourers to take the cream cans to the station. Milk is purchased by these creamery owners from the agriculturists who personally come there and sell it to them. Price for milk is paid to the agriculturists according to its butter contents. The profits of these creamery owners are steadily declining because of the (*i*) internal competition, (*ii*) absence of gradation, and hence obtaining lower rate for the cream, (*iii*) high transport costs from Anand to Bombay and (*iv*) poor quality of milk due to partial starvation of cows and buffaloes.

The average income of these creamery owners is about Rs. 100 per month. They also turn the skimmed milk into casein. But they adopt very crude process. They use whey, while for better results more suitable acitic acid

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*The equipment of a small creamery owner is usually worth Rs. 500 to 600. His requirements are the following : —

Milk separating machine of 90 gallons capacity	...	Rs. 300
2 brass 'kothis' (pots) for collecting milk	...	Rs. 50
1 copper 'bamba' and 'tapela' for heating water	...	Rs. 60
3 dozen cans for despatching cream	...	Rs. 120
Weighing scales and measures	...	Rs. 50
Buckets and lanterns, etc.	...	Rs. 20

ought to be used. But as these manufacturers do not know its proportion, they do not try to use it at all.

Their casein is sold at low rates in foreign countries, where it has to withstand the competition of more scientifically prepared casein of Argentine, France, etc.

The Government should, therefore, guide them and show them how to adopt more scientific methods of manufacturing casein so that they can realise better prices. Moreover, some local industrial use should be made of casein. If this is done, its local market being assured, this industry will get a fillip. The industries in which casein can be used are veneer and plywood mills, match works, textile industry, leather industry, etc. Hence the possibilities in this direction should be explored. For casein making these creamery owners have to keep big tubs, a wooden press, 'chaddars', sieves, etc.*

CASEIN POWDERING

There are also two independent workers at Anand who are engaged in powdering casein. One of them when interviewed informed us that his equipment was worth Rs. 2500 and it consisted of two powdering machines and a crude oil engine. In 1937-38 he purchased from local creameries 75 tons of casein valued at Rs. 21000. The casein powder was exported by him to England, Germany, Holland, etc., and he realised total amount of Rs. 22,500. He thus got Rs. 1500 for his work. However, he had to occasionally engage a casual labourer and to keep

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*Generally for casein making a creamery owner requires the equipment worth Rs. 250—300. He requires :—

7 tubs	Rs. 80
1 wooden press	Rs. 60
Chaddars, sieves, etc.	Rs. 75
Miscellaneous articles, gunny bags.	Rs. 50
Total	Rs. 265

a permanent assistant. Hence his annual net income was Rs. 1200.

Polson's products are of established reputation and as such they find markets in foreign countries. But for the sale of cream of other small concerns of Gujarat, there is a great difficulty. No classification is made about the quality of cream. Hence persons producing better quality cream have to suffer, and, at times sell at the rate of low quality cream. When, therefore, better quality cream does not realise better prices, there prevails a general tendency not to prepare better quality cream at all.

Hence gradation should also be made of the quality of butter as well as cream, so that the consumers can know which is good quality and which is the inferior one, and that, better quality may realise better price. At present as it is not possible to make out the quality, the consumers have to depend on advertisements and half-true statements of the dairy owners. The adulteration of vegetable oil with butter ought to be entirely stopped. This sort of adulteration is taking place on a greater scale in Bombay. While Bombay happens to be the principal market deciding the rate of butter. In fact, vegetable ghee is ruining both the ghee and butter trade.

Another demand of the creamery owners is for the reduction of railway freight on cream. Bombay being the chief market for their cream, the reduction in railway freight will be of great help to this industry. During the last World War the railway freight on cream despatched from Anand to Bombay was Re. 0–12–0 per maund, and gradually it is increased to Rs. 2–3–0 per maund ; while the freight on milk from Anand to Bombay is Rs. 1–8–0 per maund. If cream is also put in the same category as milk the reduction will be of great help to these creamery owners.

In order to develop this industry it is necessary to establish one model Creamery and Dairy at Anand which can guide the other owners of small creameries and dairies of the surrounding areas.

If some by-products like skim-milk powder, condensed milk, etc., could be manufactured, they would help and encourage the growth of the dairy industries a great deal.

In this connection, the Imperial Research Creamery at Anand is at present closed, and, if the Bombay Government take up this problem in hand, its equipment can be utilised for opening a model creamery and dairy.

Problems like (*i*) transportation of milk to Bombay, (*ii*) manufacturing of better quality casein, (*iii*) manufacturing of condensed milk and milk powder, and (*iv*) manufacturing of better quality cream and butter, etc., can be tackled by such Research Creamery and Dairy, and, its findings be made available to the small creamery owners of the adjoining areas.

It is also essential to consider the question of manufacturing milk powder and condensed milk in this region. For, now-a-days, the consumption of milk powder is increasing by leaps and bounds. It is reported that Bombay, imports nearly 20 to 30 tons of skimmed milk-powder per month. Hence the details about manufacturing this product should be worked out by the Government Research Institute and the information should be made available to other manufacturers.

CHAPTER XII

OTHER INDUSTRIES

AGATE STONE CARVING

CAMBAY is the only centre of Gajarat where agate stone carving is carried on, for over centuries, and as such, its reference is made in their memoirs by the foreign travellers who visited India in the days of Moghul Emperors. However, as yet no systematic attempt is made to study the conditions of the agate stone carvers of this centre.

At present at Cambay 365 persons are engaged in this industry, and according to the nature of their occupation they can be further classified as under:—

10	Merchants selling ready made agate articles. These merchants hire the services of the expert carvers, employ them in their karkhanas and ask them to make various agate articles.
50	Karkhandars, or independent agate stone carvers, who also hire the services of other artisans, make agate ornaments, and sell them in the various centres of Gujarat.
150	'Khondvā Vālās' that is the artisans who cut the rough agate stone into required pieces.
100	'Ghasias' that is the workers on the lapidary's wheel.
30	'Sār Pādnār' ('Sāllis' or Vindhārs that is drillers.)
25	*Pāttimārs or those who polish these articles by hand process.
365	

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* Pattimars do polishing of the agate articles. Polishing means smoothening the edges of agate beads. Now this is done mainly by machine. When the machine was not available, Pattimars, that is the polishers existed as a special class. But now most of them are rendered unemployed. Still, however, certain articles like 'holders' are likely to break in the wooden drum (tub) driven by machine and only for such articles the services of Pattimars are now required.

As for the raw material, that is agate stones, required by this industry, it should be remembered that the manufacturers of Cambay, if they are small karkhandars, two or three of them join hands together and put a combined order for their requirements of agate stones to the outside places. Usually they give order to the Rajpipla or Adadra agate stone quarry owners or, at times to the Morvi merchants. Generally they give an order for Rs. 1000 to Rs. 2000 worth stones and when the stones arrive they divide the lot among themselves.

It is very difficult to make out the quality of these stones before hand. For making them useful for carving, they are put in a earthen pot, and then baked by cowdung fire. Then the stones are taken out and cut at one of their ends, and they are sorted according to their varieties *i.e.* white, yellow, black, green or having strips of different colours (‘dorādār’). Other stones, if turned to ashes, or those not picking up any colour during the process of baking, are thrown out.

If some of the stones are required to pick up more colour the process of baking is repeated. But under no circumstances they are baked thrice, for in doing so, generally they are spoiled and rendered useless.

The instruments used by these workmen are simple, and in most of the cases not at all costly. The rough stone is sown with a small saw and then chiselled with the help of iron spikes and horn-headed hammers. It is then polished. However, fine instruments like diamond-tipped drills are necessary for making certain articles like beads, cannons, etc.

The Cambay artisans make cups, saucers, vases, pens, card racks, ink stands, knives, daggers, swords, handles, paper cutters, paper weights, etc. But more delicate and fine articles made chiefly for the ladies wear are necklaces, wristlets, armlets, brooches, rings, ear-rings studs, buttons, amulets, small slabs, etc.

Formerly, that is, by about 1922 the 'Khondva Valas', means the artisans who used to cut the agate stones of required size, used to earn about Rs. 2 per day. But their present income is hardly annas 8 to 10 per day. Big or small pieces are made of the agate stones. Generally they are cut into four different sizes. If the karkhandar wants big pieces, he generally instructs them to make pieces suitable for 'modans' (modans means big beads). The second size is definitely smaller than the first one, and for this variety they are instructed to make the pieces suitable for a 'kanthi' that is for a necklace of small beads. Otherwise they are asked to make pieces suitable for 'tasbi', which means, for making smaller beads usually of the size of 'tulsi' beads. The last quality is known as 'anguthinu nang' that is the stone suitable for a ring.

For making the pieces of required size the artisans are paid on piece rate, that is per 1000 agate stone pieces. For 'Modan' or the first variety they are paid Re. 1-8-0 to Rs. 2-0-0; for 'Galani Kanthi' or the second variety Rs. 4-0-0 to Rs. 5-0-0; for 'Tasbi' or the third variety Rs. 4-0-0 to Rs. 5-0-0; and for the fourth variety Rs. 4-0-0 to Rs. 5-0-0. At the most an artisan can make 300 modan pieces in a day, for, it is his duty to give proper shape to these pieces (fallā pādvā) and then hand them over to the 'karkhandar'. He gets generally annas 8 to 10 per day. Even though more remuneration is offered for making the 2nd, 3rd, and the 4th variety stone pieces, they require more time, hence their remuneration practically remains the same. These modans or agate stone pieces are then handed over to the 'ghasia' for smoothening them. Generally per 100 modans a 'ghasia' gets annas 12. At the most he is able to smoothen 150 modans in a day, so the 'ghasia' gets about Re. 1 to 1-2-0 per day.

After smoothening these beads they are handed over to the 'pattimar', who puts these beads in a leather bag containing polishing material like the fine powder of agate stones and other chemicals. He fills this leather bag with water and closes the mouth of the bag; then he winds a leather strap over the circumference of the bag, and, with the help of another pattimar begins to pull and push the strap into opposite direction in order to rub the beads inside with the powder and chemicals. These artisans get annas 5 to 6 each per day.

With the introduction of power driven tub this hand process is practically given up for the last 5 years at Cambay. But, there are certain articles ill suited for getting polished in such an electrically driven tub, *e.g.* holders, knives, daggers, etc. They are likely to break in the tub driven by motive power. Hence the hand process still persists for such articles.

Ultimately this polished bead is handed over for drilling to a driller ('vindhar'), and for drilling he gets 9 pies per modan. At the most he can drill 20 modans in a day. His earning, therefore, is about annas 15 per day.

There are only 4 merchants who export agate articles to the other parts of India and also to foreign countries like Africa. Mostly their foreign markets are in Nigeria and the Gold Coast of Africa. Their estimate about the agate stones (raw material) required by this industry at Cambay is of Rs. 10,000 per year, while, the output of agate articles is of Rs. 6,00,000.

Their raw material (or the agate stone) requirement has practically remained the same, but because of the depression, and, the manufacture of imitation as well as the ruby and saphire goods in other centres which work as a substitute of agate articles, price of the 'akik' goods has gone down, with the result that the artisans' and the manufacturers' remuneration and margin of profit have declined. It would, however, be interesting to point out here that from the beginning of the present century the manufacture of artificial as well as real ruby and saphire goods is also started at Cambay.

RUBY AND SAPHIRE WORK

Bangles, ear-rings, etc., of rubies and saphires are also made at Cambay. This industry came to be established in Cambay by the beginning of the 20th century.

About 355 persons are engaged in (*i*) artificial ruby and saphire, as well as (*ii*) real ruby and saphire work. They can be classified as follows:—

100	Outworkers	
35	Ghasias	
20	Karkhandars	
100	Polishers	engaged in the above karkhanas.
100	Cutters	
355		

Artificial ruby and saphire stones are available from foreign countries like France and Switzerland. They are imported more by the centres like Jaipur, Bangkok (in Siam) and Rangoon (in Burma). As labour is cheap at Jaipur, mostly from Jaipur ready made pieces of artificial rubbies and saphires are imported at Cambay, while real rubbies and saphires are imported from Bombay. There is great difference in the price of real and artificial ruby. When the price of imitation ruby is Re 0-2-0 a 'rati', price of real ruby is 17 sh. or 13 Rupees for 1 ct.

Processes for making articles from artificial rubbies are akin to those of producing the agate ones. First, they make their pieces of required size, then give them rough shape by polishing, and finally they are smoothened.

The condition of the workers in this industry is practically the same as in agate stone carving. On the average they earn annas 8 per day. About Rs. 25000 worth artificial goods, and Rs. 25000 worth real ruby and saphire goods, are annually manufactured at Cambay.

It is reported that agate stone, rubby and saphire work of Cambay has suffered a great deal because the artisans are not able to give better lustre to their work. Cambay is also known for making the emblems of God Sun, God Shiv ('शिवलिंग'), etc., from crystal stones (स्फटिक). But as the times pass by, market for these emblems is fast declining, as the public faith in some of the religious beliefs and especially in the idol worship is shaken.

It can be said that agate stone carving is an industry suffering from geographical inertia at Cambay. In the hey days of Cambay port, when its imports and exports rolled in crores of rupees and rich business magnets used to reside at this port, there was local market for the agate goods. Foreign travellers who used to touch the Cambay port also purchased agate articles. But now there is no local market for these goods, while they have to import raw material (agate stones) from outside; and even though the former advantage of a local market has disappeared at Cambay, this industry still persists solely because the expert hands who are skilled in agate stone carving are residing there.

PAPER MAKING

Paper making has practically died out from Gujarat. Otherwise she was once known throughout India for her handmade paper. 'Kagadis' (paper makers) of Ahmedabad, Baroda, Patan and Ankleshwar were well reputed for the quality of their paper and for their honesty. They were holding good status in the society during those days.

When Rajnagar was converted into the Capital Town and the seat of the Government by Ahmedshah Abdally in

1492, 'Kagadis' from all over Gujarat were attracted to this town. Ahmedabad thus became the leading centre of paper making industry of Gujarat.

For preserving the records, the various State Offices needed considerable quantity of paper; hence there was good local market for paper in Ahmedabad.

The dealings of Ahmedabad 'kagadis' were so vast that their investments into the raw materials once ran into lakhs of rupees. For the payment of wages to the labourers, and, for the purchase of raw material, and stocking the goods, and selling them to upcountry markets on temporary credit, they needed capital. Hence with the rise and growth of this industry indigenous shroffs began to finance them a great deal, and some of them even resided in 'kagadipura' for the very purpose. During these good old days of handmade paper, about 600 families of 'kagadis' were engaged in paper making at Ahmedabad.

But by the latter half of the 19th century they began to feel severe competition of foreign machine-made paper. It was available at cheap rate and was very attractive. They, therefore, could not withstand its competition. In the beginning of the 20th century Paper Mills also began to be established in different parts of India.*

As a result, the fate of paper making handicraft at the various centres of Gujarat was sealed for ever. By about 1921 there were, therefore, only 7 karkhanas for making handmade paper in Ahmedabad, while at present there are only two. That too, they do not get sufficient work. In the other centres of Gujarat 'kagadis' no longer make the paper, and they are mostly found as the dealers in foreign paper or the book-binders.

Handmade paper making is a seasonal industry, for, the waste paper used as raw material has got to be taken to the river for washing purposes in order to remove its dirt and ink before making its pulp.

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* Including Gujarat Paper Mills Ltd., Barejadi in Ahmedabad District.

One of the paper makers who was interviewed by us stated that he required as raw materials waste-paper, soda, soap and bleaching powder.

His equipment consisted of a 'kundi' (for keeping paper pulp), sadadi (mat), 'khadi' (white clay) and 'kuchada' in all hardly worth Rs. 25/-. For making 300 'gha'[*] paper, 30 maunds paper pulp was required. For making 30 maunds pulp, he had to purchase 42 maunds waste paper. This he purchased at 2½ rupees a maund from the local market. About the cost of the paper he gave us the following information:—

For making 300 'gha' paper 42 maunds of waste paper cost at Rs. 2½ per maund	Rs. 105-0-0
One artisan whom he employed to help in all the processes, was paid Re. 1-8-0 per 10 'gha' paper. He worked for 25 days and got	Rs. 45-0-0
Two labourers he employed for cutting the paper, at the rate of Rs. 2 for 100 'gha'	Rs. 6-0-0
Carriage charge for taking waste paper to the river	Rs. 12-8-0
For washing waste paper he required 3 maunds soap per 100 'gha' (at Rs. 3 per maund)	Rs. 27-0-0
Total	Rs. 195-8-0

While he sold these 300 'gha' unglazed paper at Re. 0-12-0 a 'gha' and obtained Rs. 225/-. His monthly earning, therefore, was nearly Rs. 30/-.

The other producer at Ahmedabad produced glazed paper which he could sell at Re. 1-6-0 per 'gha'. For glazing purposes he needed starch as an additional raw material.

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[*] 'Gha' means a quire of 24 sheets of paper.

The yearly consumption of waste paper of these paper makers comes to 960 maunds, worth about Rs. 2540. Bleaching powder, soap, starch, etc. cost about Rs. 1100. And their output per year is estimated at 7200 'gha' (of 24 sheets) worth Rs. 7650.

It is said that ten years ago the annual production of Ahmedabad was 20,000 'gha' of hand made paper and the prices were also double than those of today. These artisans claim that their paper is more lasting and is very good for preserving records. They claim that their paper can even last for hundred years, and state that they suffer due to the lack of encouragement from the Government, Municipalities, and the public.

This is one of the decaying industries of Gujarat, and, with the advent of machinery, as cheap, attractive and more smooth polished and glazed paper of suitable size and weight is available, it is very difficult to suggest ways and means to uphold this handicraft.

GUT MAKING

As regards guts making it can be said that even though this industry has a future in Gujarat, it is as yet neglected by the authorities concerned. It is in the hands of the low-caste people who are backward and follow their crude old methods in making the guts. What they require is the proper guidance in making guts, and, the demonstration about the uptodate implements used in this industry at the various centres. In absence of such efforts this industry, with all the local advantages of (*i*) a market and (*ii*) cheap labour, is feeling increasing competition of the imported goods, hence it is on the verge of extinction.

There are now hardly half a dozen artisans in Ahmedabad engaged in guts making industry. They purchase intestines at Rs. 6 or 7 per hundred and work upon them with their simple equipment hardly worth Rs. 5/-.

They apply 'ankdanu dudh' to intestines, then rub them by bricks or 'kach kagal' and then twist them by a 'chakkar' (wheel), in order to make them straight. Afterwards they join these short intestines by applying knots in order to make them of a sufficient length of 30 to 32 'hath'. Ultimately they tie such intestines to the wooden poles and rub them with 'kathi' (jute thread). Thus the guts are made to which they apply oil and sell in the local market.

For making a gut of 30-32 hath, 12 intestines are required, and 4 men take two days for making 12 guts. These guts are sold at Re. 1-4-0 each. Hence per gut 4 annas are earned by the worker and the average income of the worker from this industry is annas 6 per day.

The artisan who was interviewed by us in this connection, had sold Rs. 1270 worth guts during the previous year, and his net income was Rs. 310. His entire family helped him in the various processes.

This is a very low occupation, for throughout all the processes intestines give very bad smell. Hence, even the bodies of the gut makers engaged in this industry, smell. It is, therefore, desirable to show these workers some solution of chemicals by the application of which this smell can be removed from the intestines, so that, they can conveniently handle them during the various processes.

The gut makers of Ahmedabad complain that for the last 25 years all the waste materials from the slaughtered cattle in Ahmedabad were taken away by the dealers who exported them to England. Because of this monopoly sale to the local dealers by the Ahmedabad Municipality, gut makers had to purchase intestines from the United Provinces, and Punjab. They had, therefore, to pay high prices for them.

Moreover, about 8 years ago, price per 100 intestines was Rs. 2 to 3, but recently, it had gone as high as Rs. 6 to

7, and at times Rs. 10. Because of the low rate of the intestines in the past, about 12 families were engaged in guts making at this centre, for, they used to have a good margin of profit from this industry. They earned about Rs. 50/- per month per family. But with the above increase in the price of the intestines, their earnings have gone down by more than 50 percent, and they now earn hardly Rs. 25 per month. They, therefore, insist that intestines should be made available to them at cheaper rate, from the local markets.

These gut makers do not know how to colour the guts, or, how to make the guts for tennis rackets. Their present output is suitable for carding purposes, and, only the carders purchase them. Guts for (*i*) carding purposes, are imported in large quantities in Ahmedabad, mainly from Delhi side, while for (*ii*) tennis rackets from Sialkot side. If the gut makers are provided with up-to-date implements and given all the hints of modern scientific methods of guts making, this industry will develop to a considerable extent at Ahmedabad, and it has also good scope at the various other centres of Gujarat.

SOAP MAKING

This industry exists in this region in a cottage, as well as, factory stage. Laundry soap making does not require any technical skill and the villagers often make soaps for their personal use in their houses.

The raw materials used are lime, vegetable oils, washing soda and silicate of soda. However, soap making on a cottage basis is a seasonal industry and it is not carried in the monsoon.

In Gujarat, Prantij is the famous centre of soap making on cottage basis. In good old days, when the railways were not available to this region, 'Golas' or washing soap of Prantij used to reach Ahmedabad by carts. With the passage of time, (*i*) the imports of foreign soaps in the Ahmedabad markets, and also (*ii*) the introduction of washing soap manufacturing at Ahmedabad proper, reduced the demand for Prantij soap in Ahmedabad market.

Still, however, due to natural advantages, Prantij has been able to hold its own in soap making. It gets mahura oil from Modasa, better quality lime and 'us' (silicate of soda) are available in good quantity in the outskirts of this town, and, labour here is also very cheap. Therefore, it is able to withstand the competition of other soaps in Ahmedabad markets.

There are, at present, three big and two small 'karkhandars' at Prantij, producing soaps worth Rs. 2,20,000, per year, and the yearly raw material requirements of these karkhandars are estimated at Rs. 1,70,000 to 1,80,000.

One of the leading soap manufacturers of Prantij, when interviewed, informed us that he employed 25 persons who were paid wages varying from annas 5 to Re. 1-4-0 each. He reported that during the previous year he made soap worth Rs. 16,000 and earned a profit of Rs. 2,000. Mainly 'gola' soaps used for washing purposes are manufactured and marketed by them at Ahmedabad. The soap making as a cottage industry is wide spread in Gujarat.

One of the washing soap manufacturers of Ahmedabad gave us the following information. His equipment was a furnace (or a 'kundi') of cement, especially constructed at the cost of Rs. 50. In addition, he had purchased one pressing machine of Rs. 75/-, 2 pans ('kadais') of Rs. 50 and 300 'khumcha' (costing annas 8 each) of Rs. 150.

Thus with the equipment in all worth Rs. 672 he had started making soap at Ahmedabad. His furnace (bhathi) was of 8 maunds capacity. That is, with 8 maunds oil as the principal raw material, soaps could be made in the 'bhathi.' He required per 'bhathi':—

	Price rate per Maund			Cost of raw Material		
	Rs.	as.	p.	Rs.	as.	p.
8 Maunds Sabarmati 'us' of 8 per cent soda	0	1	3	0	10	0
4 Maunds Sihor 'us' of 25 per cent soda	0	6	0	1	8	0
4 Maunds Sihor 'us' of 10 per cent soda	0	4	3	1	1	0
2 Maunds Lime	0	12	9	1	9	6
7 Maunds Mahura Oil ...	6	8	0	45	8	0
25 Seers Castor Oil	6	2	0	3	13	3
10 Seers Cocoanut Oil ...	10	0	0	2	8	0
10 Seers Rosine	7	4	0	1	13	0
15 Maunds Fuel	0	4	9	4	7	3
				62	14	0

With Rs. 63 worth raw materials, he could make 12 maunds 6 seers soap, of which he prepared 1944 cakes, and sold them at Rs. 7-4-0 for 200 cakes and realised Rs. 70/8/-.

But in the process of making the soap, he incurred the following labour charges for the various processes.

1	For taking the hot liquid from the 'bhathi' in the convenient vessels to allow it to cool he employed a female (thārnār) who was paid ...	0—4—0
1	Printer	0—8—0
1	Weigher (tolnār)	0—5—0
2	Kneaders (masalnār)	1—0—0
1	Arranger (gothavnār)	0—2—0
1	'Golas' maker (pind karnār) ...	0—8—0
		2-11—0

With the raw materials of Rs. 62-14-0, and the labour cost of Rs. 2-11-0, in all by incurring the total expenditure of Rs. 65-9-0 he earned Rs. 5 per 'bhathi'. He prepared such 15 'bhathis' in a month and earned Rs 75/-. But from this, Rs. 20/- rent, and about Rs. 3/- ware and tare of the implements were to be deducted. His net income was, therefore, Rs. 52/- per month.

Washing soap making as a cottage industry is, therefore, on a sounder footing in Gujarat. In a decentralized form it caters for the needs of the various localities, and, as such it is wide-spread in this region.

However, during the last two or three decades, small factories making the washing soap have come into existence, and such factories we find situated at Ahmedabad, Surat, Baroda,* Navsari, Sidhpur, etc.

In some of these factories, attempts have been made, to produce and market toilet soaps, but they have not proved successful as yet. If some scented soap is prepared by them, it is found to be inferior in quality to the foreign imported one.

In the ordinary course, even to-day, we find Bombay Province importing Rs. 5-6 lakhs foreign toilet soap per year,‡ and, a considerable quantity of this soap must have been consumed by Gujarat.

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*In the directory of the Large and Small Industrial Establishments in Baroda State, during the year 1936-37 mention is made of 3 Soap Factories situated at Baroda, of which the Baroda Soap Factory employs 10 persons, the Sarita Soap Works 5, and the Gujarat Soap Works 1. All these factories employ manual labour and do not use any motive power. Similarly at Ahmedabad, there are 4 or 5 big and 15 to 20 small factories and a comparatively large number of persons is found at work in the big factories.

‡Pre-War 1937-38 figures. It will be interesting to quote here an extract from the findings of the Bombay Economic and Industrial Survey Committee. In their report Vol. I, page 85 they state: "The big soap factories are located in the City of Bombay which manufacture both toilet and laundry soaps. Some of these factories also undertake the production of other toilet preparations like scented oils, pomades, face powders, etc. No statistics regarding their production are available, but it would seem that a good proportion of the fall in the foreign imports of soaps is traceable to the production of these factories. It may be noted that as in case of other factories, here too, a considerable part of the indigenous output is due to the establishment within the Province of foreign owned and foreign managed concerns."

The manufacturers of our country need expert guidance for the manufacture of toilet soap, which seems to be the trade secret of the foreign concerns, and, without special efforts on the part of the State, very little will be achieved in this direction, in near future. Scholars in Chemistry should be specially deputed for studying the manufacturing processes, and finding out the exact proportion of the ingredients used in manufacturing soaps in foreign countries. Unless and until such special efforts are made, Gujarat shall have to depend for her requirements of toilets upon the foreign countries.

BIDI MAKING

This is a cottage industry and as such no power or machinery is required for making a 'bidi'. Almost in all the villages, towns and cities of Gujarat, this industry persists, for majority of the population belongs to the class of smokers. Masses cannot afford to purchase cigarettes as they are costly and beyond their reach, hence, they favour 'bidis'. At some of the leading bidi making centres of Gujarat like Umetta, workshop conditions prevail, and, as the number employed in such karkhanas exceed the limit of 9, these concerns fall under the definition of 'small scale factories.

Kaira district is famous in Gujarat for the cultivation of tobacco crop. As such there are many important centres in this district, where 'bidi' making is done on a considerable scale. We would like here to study the conditions, prevailing in this industry at Umetta, the leading bidi making centre of Gujarat.

There are six big karkhanas at Umetta employing in all 330 workers for making bidis. One of the karkhandars when interviewed informed us that three kinds of bidis are generally prepared in Gujarat; (*i*) 'nakhiā' (*ii*) 'beech-band' and (*iii*) 'sādi' (ordinary).

In making best quality 'nakhiā' bidi available in the market at Re. 1-4-0 per 1000, the following expenditure is incurred:

Tobacco	0-3-0
'Timru' leaves	0-3-3
'Dora' (thread)	0-0-3
Labour charges*	0-5-0
Other charges	0-0-9
Packing charges—'Devdar' box, etc. ...	0-3-9
Allowance for fluctuation in market rate and other accidental charges ...	0-2-0
Total Re. ...	1-2-0

Hence per 1000 bidis, there is a net profit of annas two to the traders.

The total material requirements of Umetta today stand at Rs. 25500. This can be further classified as under :—

Timru leaves imported from Godhra and Dahod side	Rs. 10,000
Tobacco from the adjoining villages of Umetta	Rs. 15,000
Paper, thread (40° yarn) etc. ...	Rs. 500
	Rs. 25,500

From Umetta every year about Rs. 58,000 worth bidis are exported. From these sale proceeds it should be realised that :—

	Rs. 25,500	are paid for the raw materials,
	Rs. 14,500	are paid to the labourers,
	Rs. 10,000	are spent for packing and transports
	Rs. 2,200	Miscellaneous
hence,	Rs. 5,800	is the remuneration of these karkhandars, which includes their interest on the capital investment, their supervision charges, etc.
	Rs. 58,000	

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*It would be interesting to note here that a worker gets Re. 1 per 1000 better quality bidis in Bombay, annas 12 at Malwan, annas 10 at Nipani, hence the Umetta workers are comparatively paid very low remuneration.

For the purchase of raw materials for (*i*) tobacco the season is 'Margshirish' and 'posh', while for (*ii*) timru leaves, 'vaishakh' and 'Jesth'.

The special demand of the Umetta karkhandars is the reduction in the railway freight as it forms one of the important items of their expenditure.* While the bidi workers of Umetta require some increase in their remuneration. They are at present paid annas 5 per 1000 bidis and at the most they can make 700 bidis per day. They, therefore, hardly earn Rs. 8/- per month.

The condition of the Umetta bidi makers is reported to be no better than that of the serfs. It is said that most of the karkhandars, instead of making cash payment to the bidi workers, induce them to purchase goods on credit from their shops. These karkhandars deal in grain, cloth, etc. Under these circumstances, if the bidi workers want cash they have to borrow it from the karkhandars.

There is, therefore, an urgent need for the Government to open a Co-operative Bank for these workers at Umetta, and, induce them to form their Association for this purpose.

Even though Kaira is one of the leading Districts growing tobacco in India, it is to be regretted that, inspite of the efforts of the Government of Bombay, its tobacco breed is not improved. Tobacco of the Kaira District is not of good quality so as to suit for cigarette manufacturing. Hence Gujarat imports cigarettes worth lakhs of rupees‡ while her inferior quality tobacco is exported in raw form.

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* They also want construction of a metalled road upto the station and the construction of a godown in the railway yard, so that, goods might not be spoiled by remaining in an open area during monsoon. Another point that they urged was the removal of tobacco tax and licence.

† Net consumption of cigarettes of the Bombay Province was of 24,85,072 lbs in the year 1937-38, *vide* Report of the Bombay Economic and Industrial Survey Committee 1938-40, Vol. 1, page 77.

This situation requires to be improved and added efforts should be made to grow superior quality tobacco in this region, in order to make the introduction of cigarette manufacturing industry, a feasible proposition for Gujarat.

Measures adopted bv the Mysore Government should be carefully studied in this connection, and, the Government Tobacco Breeder at Nadiad should be given all the financial aid to carry out intensive experiments on bigger scale. Progress of the Western Tobacco Co. at Baroda, manufacturing cigarettes should also be watched with interest in this connection.

MATCH MAKING

As regards Match Industry, it should be noted here that several attempts have been made in the past to establish this industry at the various centres of Gujarat. However, these efforts have not been quite successful.

It should be remembered that the growth of the Match Industry in Gujarat (like in other parts of India) followed the doubling of the import duty on matches in 1921. By 1935 the number of match factories had, therefore, increased but by 1938, it again fell. The reduction is mainly due to the rise and growth of the Western India Match Factory, which claims to its credit 78 percent of the total output of India. This concern has been able to eliminate a number of small concerns from the field.

Thus (*i*) Gujarat Islam Match Manufacturing Co. Ltd. of Ahmedabad, (*ii*) Hindu Islam Match Factory of Kapadvanj, and (*iii*) Hindustan Match Works of Surat worked for a short period and then they were closed. It being so, at present, there are only 5 Match Works in Gujarat out of which 3 are situated at Cambay, while 1 at Petlad and 1 at Billimora in Baroda State.

The particulars, regarding the working of these Match Factories in Gujarat, are as follows :—

Name of the Factory	Active period of work No. of days	Quantity of Match Boxes turned out Boxes Gr. doz.	No. of persons employed
*The Husein Yaver Match Works, Cambay	112	969-5-0	200
*The Cambay Match Works, Cambay	208	5218-0-0	275
*The Harihar Match Works, Cambay	...	481 gr. of Bengal lights 1995-34-6	...
†The Datar Match Works, Petlad (Baroda State)	...	5,97,448 grs.	192
†The Billimora Match Factory, Billimora	...	47,945 grs.	...

Match making is wholly a factory industry in Gujarat, and it deserves greater attention of the authorities concerned. All possible measures should be adopted to assure its growth and development. Some steps are also needed for its protection against the competition of foreign as well as the above large scale concern. If possible cheap soft wood should be made available to this industry from the forests of Gujarat. In the absence of proper investigations about suitable wood for match making into the forests of Gujarat, these match factories get some of their requirements from the Central Provinces and some from the

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* Figures taken from the Cambay State Administration Report for the year 1937-38.

† Figures taken from the Baroda State Administration Report for the year 1939-40.

... Information not available.

Andaman Islands.* Rajpipla forests† afford good field for investigation as regards the availability of soft wood and possibilities of developing match industry.

Match Making is an important cottage industry of Madras, and the possibilities of its development on cottage basis in Gujarat remain to be investigated.

GLASS INDUSTRY

In Gujarat, Kapadvanj (in Kaira District) is noted for this industry for over a century or two. There were formerly 25 to 30 bangle manufacturers who used to make crude glass bangles (known as 'dudhiā bangadi') from the glass sand imported from Allahabad. They also made rough bangles from the liquid glass prepared by heating broken bottle pieces. Joints of these bangles made from broken glasses were visible, while, 'dudhiā' bangles were thick and rough. The demand of these Kapadvanj bangles, therefore, declined with the imports in India of better quality bangles from the glass factories of Czechoslovakia, Belgium, Japan and Germany.

There are now only two karkhandars employing about 24 labourers mostly concentrating upon making of 'ābhlā' or small mirrors. These 'ābhlās' are used by shepherd women to decorate their dress, and the market for them is Kathiawar and the Nizam's Dominions, where women still wear their old fashioned dress with decorative mirrors.

Broken pieces of globes (chimneys), mirrors, etc. are collected from the streets by the municipal sweepers and those of the soda water bottles are gathered by the owners of the aerated water factories at Ahmedabad, From these people, Kapadvanj karkhandars purchase their raw material. Bottle pieces they purchase at the rate of 4 to 6 pice per maund* while globe (chimney) pieces at the rate of 5 to 6 annas a maund.

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* As these islands are occuped by the Japs at present, imports from these islands to India are nil.

† It would be interesting here to note that because of the existence of soft wood, especially the simal trees, in the Panch Mahal Forests when the Bombay Economic and Industrial Survey Committee inquired from the match factories, for the utilisation of the same in making splints and veneers, they replied that this wood was not suitable. For, splints made from the Bombay variety did not retain natural whiteness but went red or black after sometime. *Vide*, their report Volume I., p. 80, in this connection.

One of the karkhandars interviewed by us required, pipes, fire bricks, moulds, and a furnace specially constructed, in all equipment worth Rs. 2,000/-. He had purchased during the previous year:

	Rs. As. P.
Broken glasses 1500 mds (including railway freight)	375-0-0
Lead 130 mds. about 6 cwt.	650-0-0
Soda Ash	400-0-0
Wages to the labourers‡	937-8-0
Coal six waggons (per ton Rs. 6)	2,000-0-0
Wood (per rupee 6 mds)	500-0-0
Cartage, packing charges and sundries	432-8-0
Total	Rs. 4920-0-0

Total sale proceeds realized by him were Rs. 6,000/- and his earning per month Rs. 90/- which included his labour and supervision charges and also the interest on his investments.

The demand for the old type of goods is fast declining, therefore, the technique of production needs much improvement to suit the requirements of the modern times. The manufacturers want training in the methods of preparing better quality bangles and they also need financial help.

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* Maund means 40 seers.

‡ He employed 10 to 12 labourers for 2½ months only. Some were paid As. 8/-, some As. 12/- and the rest Re. 1/- per day. Most of the orders were received by him in winter, and the brisk season for making the glasswares lasts for about 2½ months.

There is only one glass works run on factory basis in Gujarat, and it is the Crystal Glass Works recently established by Mr. Gaur at Sant Road.

The Works employ 24 persons, and, produce very attractive polished bangles which can easily withstand the competition of foreign bangles in the Indian markets. As regards their shape and finish, that is their quality, there are no two opinions. But being a new industry it does require State patronage and guidance in order to develop its growth swiftly.

Even the Tariff Board Inquiry Committee has opined that Indian Glass Industry will thrive and be able to withstand on its own, in future, if it is given temporary protection for comparatively long period. They came to this conclusion because necessary raw materials, glass sand and chemicals, as well as cheap labour, and, markets are assured to this industry in India.

Much of our glass products like bangles, mirrors, glass sheets, etc. are imported from the foreign countries. Hence markets for our indigenous industry are assured. All the necessary steps should, therefore, be taken to see that this only glass works of Gujarat does not meet with unnecessary impediments in these its initial stages of growth.

ENAMEL WORK

Enamel work is carried on at Kapadvanj on a very limited scale. There are only two karkhandars making enamelled gold and silver buttons, ear-rings, etc.

Silver and gold required for their work are mostly supplied by the customers, and the karkhandars are required to keep coal, kerosene, oil and chemicals for enamelling purposes.

On an average these karkhandars earn Rs. 50/- per month; and they pay to the two labourers employed by each of them in their karkhanas Rs. 15 to 16 a month.

They receive orders from a Surat dealer and from stray customers. Their equipment consists of an agate mortar ('Akik ni Khal'), hair brushes, files, and nitric acid. In foreign countries polishing machines are used for adding to the lustre of the enamelled articles. But these our karkhandars are not acquainted with the latest developments in the processes of this industry in foreign countries. They, therefore, require proper technical guidance.

This industry has a good future, but without the active interest of the expert technicians and the financiers it is not likely to show any appreciable sign of development in near future. Enamelled articles worth lacs of rupees are imported in our country every year, and, there is no reason to see why this industry cannot be localised in this region by putting it on a more scientific footing.

IVORY WORK

Ivory carving from the point of view of numbers employed, occupies a very insignificant position in Gujarat. Ivory bangles or 'Hāthidāntanā Chudā' are mostly put on by the Hindu girls at the time of their marriage ceremonies. But their designs are old fashioned and out of date. In many centres products of the same kind are produced by most of the carvers, and, practically there are no new developments in the art itself.

Ahmedabad, Surat and Baroda are the prominent centres where ivory carvers ('Chudgars') are found congregated in numbers, and mostly catering for the local needs. They are also found at work in the small towns of Gujarat.

As real ivory bangles are dear, they are out of the reach of the masses during these days of depression.

Moreover, artificial ivory bangles, rubber bangles, and imitation goods work as cheap substitutes. While, the public taste is fast growing for the use of glass bangles.

Under the circumstances, unless ivory carving is improved and a radical change in their designs is made, it is very difficult to suggest as to how to put this industry on its former footing.

CLAY WORK

Under this head we propose to study the conditions of clay work at Patan. Patan is famous for over centuries for its clay work, or, for the various toys and articles made by her potters. The potters of Patan make clay figures of national leaders, animals like dogs, deers, horses, etc. and insects and reptiles. In addition, they make 'dhupias', 'picdanis', 'mevadanis', etc. For the playthings of the little children, their toys served a very useful purpose in the past. They also make clay figures of frogs, tortoise, fish, ete. so devised as to be able to swim in water. In the by-gone days when the art of toy making was not developed to such an extent as at present in the orher parts of the globe, and when celluloid and rubber toys were not available, there was a good market for these toys in the various centres of Gujarat and even in Bombay. In addition to these toys the potters of Patan used to export even earthen pipes for smoking purposes to Bombay.

Side by side with the making of pots they prepare in small quantities the above clay articles. There are at present about 10 skilled potters at Patan whose clay work is considered to be better than those of the others. But because of the modern developments in toy-making industry elsewhere, these toys of Patan are found less attractive, inconvenient, and costly because being of clay they break. Also they are not so good in polish or finish. The art of colouring, therefore, requires to be improved.

These toy makers complain that the prices of their toys have gone down by more than 60 per cent* and that, they find their markets curtailed to the extent of 50 per cent† after the last World War. If, therefore, this art of making clay toys is to thrive, it requires to be put on a more scientific footing. Up till now these potters are working with their age old crude implements and equipment viz. 'Nimbhādo', earthen dies (bibās) and 'Chāk' (spinning wheel). They have got no special implements to make the toys, and, that skill which renders the wooden toys of Mahuwa appear life like, is wanting in them.

It is, however, gratifying to note that the Baroda State authorities have begun to evince interest in this industry and we hope that in near future they will be able to put it on a better footing.

Potters are found making earthen pots in the villages and towns, while lime and brick kilns are also worked in the various quarters of this region. Stone quarries also exist and they are worked for obtaining road metal and also for necessary stones required for building purposes.

ARROWS AND BOWS MAKING

Arrows and bows making was once one of the important means of occupations of the 'Tirgars' of Gujarat. They used to make them during winter and sell two-thirds of their production to the merchants, while one-third of it they

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* The follwing table gives us the idea about the fall in the price of the various Patan toys :

Article	which used to fetch in 1919	now fetches
	As.	As.
Elephant figure	3	1
Deer ,,	6	3
Dog ,,	2	1
Serpent ,,	8	3

†Before the last World War they used to sell Rs. 900 to Rs. 1000 worth toys, while they are now hardly able to sell Rs. 400 worth per year.

used to personally sell to the 'Bhaibandhs', 'Dharālās', and Bhils who visited their residence for the very purpose. Up to the middle of the 19th century arrow-making industry† was flourishing in Gujarat and in other parts of India.

About 2,000 Tirgars of Gujarat* used to remain busy in making these weapons throughout the winter and summer season. They used to bring a 'bhari', a head load of 'radas' (a special variety of Bamboo) from the river banks on Kapadvanj side. Their 'Bhari' generally contained 500 'radas'. They were cut into 4 or 6 pieces so as to suit the size of the arrow. The small sticks were then heated and made straight by physical force; and then they were coloured. After this was done, on one of the ends of the sticks a cavity was made and a 'bhāludā' or pointed iron knife for needle was inserted in it. In order to assure that this needle was not coming out, and it stuck properly to the arrow, glue was applied to it. After thus fastening the iron arrow-head to the arrow, the other end of the arrow was scratched in order to fix that side of the arrow properly on the thread of the bow while taking the aim.

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†The 'Tirgars' of Gujarat are illiterate and backward people living in the border villages of the region. Virtually arrows and bows making industry is their monopoly. Nearness of forest make it necessary for the agriculturists of the border lands of Gujarat to make use of these weapons to drive away the wild animals whenever they come across them. For hunting deer and hare arrows still serve useful purpose. The 'Tirgars' themselves go for hunting these animals and sell their catch to the Garasias, Rajputs, Naikdas, Thakardas and Muslims. However, the claim of the arrow as a formidable weapon in the battlefield has now disappeared. On this account the market of the arrow and bow makers (Tirgars) are greatly reduced. Now the Tirgars make the arrows mostly for their personal use for hunting purposes.

* These Tirgars being illiterate could not immediately give us the grand total. But they gave us the following information about their numbers at the various centres or in the various parts of Gujarat.

A. Lunawada Side ... 150

Lunawada 25, Godhra 30, Sathamba 6, Totun 6, Dharamadi 4, Gabat 2, Vanoda 2, Janop 2, Sihoru 2, Dihod 2, Virpur 3, Saroda 2, Varghari 10, Kothamba 30, Denavad 4, Khanpur 10.

B. Balasinor Side ... 1000

Bhanthra 150, Otwal 200, Nagamu 150, Balasinor 20, Sutaria 60, Vasadra 25, Dev. 150, Limbdi 50, Pandva 250.

C. Ahmedabad Side ... 200

(Bhal & Khari Kantho)

D. In Addition the Tirgars reside in the villages of Kanod and Jantral and they are also found in the villages of the (1) Chhota-udepur, (2) Devgad-Bariya, (3) Jambughoda, and (4) Rajpipla States, and (5) The Sankheda Mewas and (6) Pandu Mewas divisions.

We may, therefore, give a conservative estimate of their total strength in Gujarat of 2,000.

For making 40 arrows without arrow heads[‡] the cost was Re.0-1-3. It worked out as Re.0-0-6 for Colour, Re.0-0-3 for 'Isam', Re. 0-0-6 for Glue, thus totalling Re. 0-1-3. While the sale price of these 40 arrows (without arrow-heads) which an artisan could make by 10 hours' work in a day was As. 8/-. Therefore, the net earning of the Tirgar was about As. 6/- per day in season. If he sold 40 arrows to the agriculturists he used to get one maund 'bavto' or maize. The best season for his sales was summer. During the rainy season he worked as the agricultural labourer in the field.

The Tirgars as a class are untouchables and most o them are addicted to liquor. According to these Tirgars, from 'Chhapaniā', that is from the beginning of the 20th century, with our increasing contact with the western countries, guns, rifles and pistols have replaced the use of arrows in the battlefields as well as in hunting. Hence, the demand for their arrows and bows have greatly declined. They now make them mostly for their personal use for hunting purposes. As they have lost this principal source of their occupation, now they mostly engage themselves in road repairs, roof repairs etc. They do odd jobs and mostly remain unemployed in winter and summer. They, therefore, maintain themselves with great difficulty by taking to hunting. They are totally impoverished and often they are made to do forced labour by the officers of some of the backward Gujarat States of the border lands.

[‡] Generally the buyers themselves used to purchase arrow-heads (bhaludas) from the blacksmiths at 0-0-6 each. They were generally getting three kinds of arrow-heads: (1) Pankhali Bhaladi (2) Sidhi Bhaladi and (3) Takoda Bhaladi.

Arrows and Bows making is one of the decaying industries of Gujarat and as such, it is very difficult for us to suggest ways and means to develop it. As its market is curtailed due to the availability of better fighting weapons, they are now made mostly for the personal use of the Tirgars.

PHARMACEUTICAL INDUSTRIES

There are in Gujarat a few Pharmacies manufacturing medicines on Ayurvedic principles. Most of them are very small in size, and they are hardly able to cater for the local needs. Important pharmacies among these are (1) The Gujarat Ayurvedic Pharmacy, having branch offices at Ahmedabad, Surat, Bombay and Rajkot. (2) The Ghanashyam Pharmacy Ltd. Baroda, (8) The Unza Ayurvedic Pharmacy, Patan and (4) The Gandhi Pharmacy Modasa.

Indian Scientists of by-gone ages have laid at the disposal of the world physicians, their important and highly valued document 'Ayurved'—a book which discusses at great length the medicinal properties of every herb, shrub, plant, creeper and tree. But during the last two centuries Indian physicians could not work in the same zeal, or, maintain the same spirit of research, with a result that as years rolled on, Ayurvedic principles began to be neglected and the public began to look down upon this treatise. Western patent medicines began to find favour in the Indian markets and at times seemed to have been fast approaching when Indian masses were likely to lose all their faith in the Ayurvedic principles. To revive the public taste for the Ayurvedic medicines pioneer efforts were first made at this critical juncture by Vaidyarajs

(1) Zandu Bhatji, (2) Naginlal Shah and (3) Jatashankar Liladhar Trivedi. In the latter half of the nineteenth century, these three well-known physicians made herculean efforts in Gujarat and Kathiawar to induce the enlightened public to take interest in the Ayurvedic medicines.

Sjt. Vaidyaraj Jatashankar Liladhar Trivedi established the Gujarat Ayurvedic Pharmacy at Ahmedabad (the capital town of Gujarat) in 1890. Not only he popularised the use of Ayurvedic medicines among the public, but he also began to seek in his efforts co-operation of other prominent physicians. For this purpose Vaidyaraj Jatashankar Trivedi started a special magazine "Vaidya Kalpa-Taru," in 1897 and therein he invited contributions of articles from the physicians of the different parts of the country. In this his effort, he met with considerable success and he could revive public taste for Ayurvedic medicines a great deal. Being satisfied with the result, Vaidyaraj Trivedi began to publish more and more literature on Ayurvedic Medicines, through the agency of his Pharmacy. Among the important puplications of the Gujarat Ayurvedic Pharmacy mention can be made of (1) 'Ghar Vaidu' (Our Family Doctor) (2) 'Sāri Santati' (Good Progeny), (3) 'Garibono Vaidya' (A Physician to the Poor), etc.

The Gujarat Ayurvedic Pharmacy has maintained very good progress even after the death of Vaidyaraj Jatashankar in 1925. The credit in this connection goes to his equally qualified and capable son Pranacharya Vaidyaraj Ravishankar Trivedi. As a result of the indefatigable zeal shown by Pranacharya Ravishankar, the Gujarat Ayurvedic Pharmacy today employs in all about 100 persons and manufactures about 700 medicines. Its annual production now stands at Rs. one lakh per year.

When interviewed by us, Vaidyaraj Ravishankar informed us that (1) there is a great need for opening a good Nursery in Gujarat, which can carry out investigations into the medicinal properties of shrubs, plants, trees, etc. Dearth of research workers, in this connection, cannot be underrated. In addition, in the opinion of Vaidyaraj Ravishankar, the foremost demands of the Pharmacy owners of Gujarat are (2) necessity of active propaganda for popularising the use of Ayurvedic medicines, (3) State help, and, (4) protection from the foreign patent medicines.

Foreign patent medicines have made heavy inroads in the Indian markets, while India's own forest wealth still remains to be utilized. Thousands of herbs and plants daily wither away without being used. Hence, the development of Pharmaceutical Industry will not only afford a good chance for the utilization of our forest wealth, but it will also afford one of the important sources of employment to the people of our country.

This industry has immense possibilities in Gujarat, which today claims to have more than 1½ million acres forests at its disposal. We, therefore, appeal the State to take keen interest in the development of this industry.

Ayurvedic medicines are comparatively cheap, and they are within the easy reach of the masses. What is required is the guarantee of their quality, and, this can be easily done by forming one Association of the pharmacy owners, which can devise the rules and regulations to be observed by the members of the Association.

SOME NEW INDUSTRIES

Among the other Industries of Gujarat, mention can be made of Swadeshi Healds and Reeds Manufacturing Co. Ltd., Ahmedabad; Kharaghoda Salt Works, Kharaghoda; The Pioneer Magnesia Works, manufacturing magnesium chloride, Kharaghoda; Naranbhai Keshavlal Acid Manufacturing Factory at Petlad;* The Baroda Chemical Works, Baroda, preparing chemicals, acids, etc*; The Alembic

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*Mainly manufacturing sulphuric acid.

Chemical Works Co. Ltd., Baroda, manufacturing medicines and spirits; The Indian Oil and Swan Chocolate Works, Devsar (Baroda State), manufacturing soap, chocolate, cocoa, etc.; four Type Foundries at Ahmedabad engaged in type casting; Alliance Metal & Rubber Manufacturing Co., Ahmedabad, manufacturing rubber and ebonite rollers for Jiggar, Padding, Starch Mangle Squeezing, Washing and Chemicking, Cloth and Yarn mercerising machines etc.†. Incandescent Gas Mantles Manufacturing concern started by Mr. P. M. Mehta at Surat, etc.

All the above concerns, before they can develop their size, have their special problems to solve. Most of them, in this their initial stage of growth, deserve State guidance and patronage. We, therefere, hope that the authorities concerned will take live interest in their proper growth and development.

A few artisans are found engaged in fire works and in making harmonium tunes, while there are a few Saw Mills, a number of Ice and Aerated Water Factories, several Printing Presses, a few Bricks and Tiles Manufacturing Works, two Pottery Works, manufacturing Mangalore Tiles,* some Electric Supply Companies, and State Distilleries.

The artisans engaged in fire-works, in making harmonium tunes, etc. require better machinery and equipment. Unless such artisans form their Association and make co-operative effort to put their industry on scientific basis, it will not be possible to put them on sounder and surer footing. Most of these artisans are illiterate, and, the size of the industries, in which they are engaged is not sufficiently large to attract the State notice. Under these circumstances, what is needed is the development of these industries at the hands of the properly educated persons. Ice, aerated water factories etc. cater for the local needs of the folks of the town in which they are situated, and as such, such small concerns will automatically grow in number with the increasing rate of urbanisation, and, the rise and growth of industrial town. In this latter group of industries, therefore, it is the manufacture of Mangalore Tiles, which deserve special State concern. In addition, the State should also regulate the working of the electric companies and guarantee at least competitive electric rates to the industrial concerns so as to facilitate, within the State limits, growth of small industries requiring electric motive power.

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†A factory has been set up in Baroda for manufacturing moulded rubber articles of different kinds used in machinery.

* (1) The Tiles and Pottery Works Co. Ltd. Billimora, employing 90 persons and (2) The Phoenix Pottery Works, Gandevi, employing 62 persons both Manufacturing Mangalore Tiles.

In the end, we do feel that, it is not possible for us to do proper justice to all the small industries of Gujarat, in such a small treatise as this. We have, therefore, given in details, the conditions of the existing important industries of Gujarat; and, as regards some new industries, as well as some minor cottage crafts, we have simply noted their existence; but we do propose to work them out at full length in the revised edition. Still, however, it can be said that, no sufficiently important industry or craft is left untouched by us. We, therefore hope, that these our efforts, of laying at the disposal of the people of Gujarat, a vivid picture of her economic resources and industrial conditions, will prove a double blessing. They will not only guide the State in its Post-War Reconstruction Programme for this Province, but they will also inspire the financiers to make use of their idle monetary resources by employing them in some profitable avenues *i.e.* by starting new industries. If so, not only the wealth of this region will develop, but there will also be more employment of people, resulting in all round prosperity of the Province. Then and then only, in the blessings of the masses of this region, the fruits of our labour will be amply repaid.

CHAPTER XIII

OUR FINDINGS

(1) ECONOMIC RESOURCES

GEOGRAPHICAL BACKGROUND...

SITUATED on the West Coast of India 'Mul Gujarat' or Gujarat proper lies between 20°.3' and 24°.5' north latitudes, and 71°.3' and 74°.4' east longitudes. The region has an area of 33798 square miles and a population of about 77 lakhs; and an eastern coastline of 200 miles. Being bound on the North, East and South by the Abu, Aravali, Vindhya and Satpuda hills, Gujarat's topography has often led the people to use for it the simile of the *'sloping roof,'* as there is gradual slope of land from East to West. Because of this, all her rivers flow from east to west and meet the Gulf of Cambay. Gujarat's climate is " monsoon climate, " and on the whole, it is pleasant and healthy. Climate is intense in the extreme north and in the Central Gujarat, but her coastline and hill stations afford good summer resorts. As the clouds of the South-West Monsoon first dash against the Sahyadri Mountains, the South Gujarat receives 60 to 100 inches rain, while the Narbada Valley receives 40" to 50" and as we reach the northern region of this province, the rainfall goes on declining. But the Abu and Aravali hills, due to the advantage of their heights and the existence of the forest, receive more rainfall.

Rivers, streams and streamulets run over the whole province. But due to the gradual slope of the land from East to West, it is an uphill task to construct in this region, good canals or water reservoirs for irrigation purposes. This task is rendered much more difficult, for, the Gujarat rivers are deep with high banks.

During monsoon the rivers and streams become torrent and flooded. These floods play havoc, as not only they wash away the soil completely and destroy the crops, but also they cause considerable damage to human lives and cattle. The problems of checking these floods are becoming graver and graver, as years roll on. Gujarat, therefore, requires expert engineers and scientists to solve these problems.

Though once gifted with many more rivers, and a coastline of about 250 miles, this region has suffered a lot from the geological upheavals. Due to these upheavals, the river Saraswati with her seven tributaries is practically lost to this province, while, as Kathiawar became a peninsula (for the river Indus changed her course) and, got linked with Mul Gujarat by land, about 50 to 70 miles coast in the north went dry. But her broken coastline has inculcated the business instinct in her people. 'Gujarat is known as a province of shop-keepers', because she is gifted with many creeks, and hence with roadsteads and small harbours. These creeks were once humming with busy life, and if properly cared for, they are likely to play the same historic role in the economic development of this territory.

Because the mouths of the rivers and streamulets open in the Arabian Sea, many creeks have come into existence; and these creeks afford good outlets for taking to sea, and, have brought into existence so many roadsteads like Sarod, Kavi, Tankara, Sajod, Hansot, Bhagwa, Maroli, Navsari, Matwad, Dandi, etc.

Here fishing is being carried on in good old fashion. If it is developed further, fish skin, fish oil, fish manure, etc., will be made available, while, if the State policy is favourable salt and alkaline products can be manufactured on immense scale. If, therefore, adequate measures are adopted, coastline of Gujarat is likely to play important role in the Industrial Regeneration of the province.

As for the development of the ports like Cambay, Broach, Surat and Bulsar, enough suggestions have been made; and, if they are translated into action, water transport will again play important part as a means of communication in this region. But if her natural environment give us a compact idea about the region as a whole, it should not be forgotten that politically Gujarat is not a single unit.

Gujarat can be naturally divided into (1) North Gujarat or Upper Gujarat, (2) Middle Gujarat or Central Gujarat and (3) South Gujarat or Lower Gujarat. But politically she is divided into something like 200 different jurisdictions. This is a great handicap coming in the way of framing a unified policy for the development and utilisation of her economic resources, and, in the expansion of the markets for her industries. Inter-State tariffs at times even baffle the growth of even small industries within the province. But if we try to overlook this political barrier, or if we simply create a vision of Gujarat as a compact area, politically united under one banner, we find immense possibilities for the development of her hitherto potential economic resources like forests and minerals, and much can be attained in the fields of her agriculture as well as industries.

FORESTS...

Gujarat is richly endowed in the forest wealth. It has more than 1½ million acres of forests of which about one million acres are good forests (reserved forests). In the days gone by, she was having more forests in the North. As the geological upheavals rendered the climate more intense in the North Gujarat (for they changed the course of the river Indus and brought about the loss of the river Saraswati), they destroyed a great deal of Gujarat's forest wealth in this part of the region.

But the clouds of the South West Monsoon, which dash against the Western Ghats on the south east border of Gujarat, cause heavy rainfall in the Sahyadri and the

Satpuda hills and then they move towards the frontier eastern hills of Gujarat. The heavy rainfall over these hills favour the luxuriant growth of trees, plants and herbs. These hills are, therefore, endowed with rich forests.

Important forests of Gujarat are those of Rajpipla, Panch Mahals, Chhota-Udepur, Devgad Bariya, Navsari and Idar. Soft and hard wood are available in sufficient quantity in these forests. The former can be used for making toys, match boxes, etc., while the latter for carts and ship building, and for building constructions.

Teakwood, simal trees, yellow wood, red wood, black wood (sisam), bamboos, kher trees, 'dudheli', 'timru' leaves and timber are available in huge quantity in these forests and they are capable of further development.

Among the minor produce, may be mentioned tanning materials made available by 'ghat bor', 'aval', 'babul', etc., and in addition lac, gum, honey, grass and innumerable herbs and plants.

Rajpipla's claim is favourably considered by the surveyors appointed by the State for establishing Paper Industry; because bamboos and grass are available in sufficient quantity in the State forests, labour is cheap, and only technical guidance is required for establishing this industry.

Godhra and Rajpipla are also rich in simal trees,* match industry has, therefore, good scope in these divisions.

The physicians visiting Chhota-Udepur and Devgad Bariya forests are impressed a great deal by the medicinal herbs of these forests. Hence, Chhota-Udepur's claim for the Ayurvedic pharmacy cannot be overlooked in this connection.

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* Mr. Mirchandani, the Divisional Forest Officer informed us that the simal trees were available in sufficient quantity for match industry in Godhra forests. But as there was no such industry, the trees were over matured and they did not know what to do with them. The transport difficulties also handicap them a great deal in utilising the forest wealth.

Lac is available in the Panch Mahals and Rajpipla forests. It is exported in crude form to outside places. Hence there is a need for establishing lac refineries at Rajpipla and Godhra.

'Kath' making is carried on in crude old fashion in all these areas as 'kher' trees are available in huge quantity. This industry, therefore, deserves the notice of the State. Expert guidance should be made available to these 'kathodias' in order that they may be able to improve its quality.

As grass is available in sufficient quantity in these areas, with a judicious State policy, cattle breeding will improve and industries depending upon milk, like butter, ghee, cheese, casein, etc., will thrive, while, if proper steps are taken, bee keeping shows bright and promising future.

The greatest handicap in the utilization of this forest wealth, is the lack of transport facilities. These forests are on the boundary lines of Gujarat, which are neither served by railways nor by bus service. There is, therefore, an urgent necessity to link up these areas with the rest of Gujarat by the net work of roads and railways.

Sandal wood plantations have already met with success in Idar forests, and they are likely to meet with success in the Rajpipla forests. While the States like Balasinor and Jambughoda are evincing interest in mango plantations. Afforestation and plantations have thus great scope in Gujarat.

MINERALS...

Gujarat was once considered to be poor in mineral resources, but from our investigations, we find her to be well blessed with these garnered fruits of Nature. Hence with the passage of time, by intensive survey, there are greater possibilities of tracing more mineral finds in this region.

Iron ore is found in Panch Mahals, Jambughoda, Rajpipla and other parts of Gujarat. Iron industry was once existing in Rajpipla State, while iron ore of considerable richness is available near Godhra (in Panch Mahals).

Manganese mines are worked in Panch Mahals and manganese ore is also found within the Idar and Jambughoda territories.

Mica is available from Jambughoda hills in considerable quantity* and its existence is also traced on the river about 20 miles west of Chhota-Udepur.

Talc (*French Chalk*) is found in considerable quantity within the Idar State territories; while it is also traced in Jambughoda hills.

China Clay (*Kecholin*) is available near Eklara (Idar State) from which superior quality cups, saucers, and other crockery and fire bricks can be made. China clay is also available near Kalol (in Panch Mahals) from where it is exported to Bombay, Ahmedabad, etc.

Agate Stones: There are agate stone mines in Rajpipla State. These precious stones are exported to outside places, and especially to Cambay. Possibilities of establishing the agate stone industry at Rajpipla should be explored. Artisans of Cambay should be induced to come over and settle at Rajpipla. Moreover, as its mining is carried on in crude manner, all the recommendations made by us in this connection, need be carried out, for the better and more scientific utilization of these resources.

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* However, it is said that mica ore has become over matured, and every year considerable quantity of mica is washed away from the hills of Jambughoda during the monsoon.

Crude Soda (*'us'*) used in soap making and bangle making is found in considerable quantity within the Idar State territory and the Kaira District of British Gujarat. 'Us' (silicate of soda) is also available in the various parts of Gujarat.

Lime Stones are available in British Gujarat, Palanpur, Rajpipla and various other Gujarat States. Lime is being used in building construction, and it is available in many parts of Gujarat in considerable quantity.

Ochres yellow and white (clays) are available in considerable quantities within the Ilol and Rajapipla State territories; while Rajpipla State is also blessed with the existence of superior quality red ochre within its limits.

In addition,. aluminium (bauxite), patent stone, and marble are found within the Rajpipla limits; while traces of various ochres (clays), China clay, bauxite, etc., are also found in the Baroda State territories. But, as for the Baroda State, these minerals are not available in sufficient quantities and, therefore, adequate measures have got to be adopted for utilizing these resources.

Existence of *lead ore* in the Jambughoda State, near iron ore, and in the Panch Mahals near Godhra, also give us hope that the intensive survey might forecast the possibilities of their development, if they are available in sufficient quantity.

We also find a quarry of white stone in the Idar State. From the stones of this quarry, famous historic buildings are built. Stone quarries of Ilol have also made available better quality building stones, and they are exported to outside places.

Most of the above resources are within the Gujarat State territories and the greatest handicap to the development of these resources is of the lack of adequate means of communication. They are, therefore, marking time for their proper development. What is, therefore, needed is the direct State interest in this connection.

AGRICULTURE AND LIVE STOCK...

Of the total area of 21.6 million acres, it is gratifying to note that about 14 million acres land is available for cultivation to Gujarat. But of these 14 million acres land one million acres remain fallow every year. In addition 2 million acres is a cultivable waste. This cultivable waste should, therefore, be utilised either for (*i*) agricultural or (*ii*) plantation purposes.

Of the 14 million arces land available for cultivation, we find, hardly half a million acres is irrigated.* Hence in the 13½ million acres land only monsoon crop is obtained. Under the circumstances, necessity for irrigation projects need not be over-emphasised. Gujarat badly needs more canals and irrigation tanks, failing which, construction of wells should be actively encouraged by the State.

Principal commercial crops of Gujarat are cotton, oil-seeds, maize and tobacco. But proper industrial use of the latter two crops is not made within the province. Agriculture being the backbone of the people of this region, greater State efforts are needed in this direction. Possibilities, of growing different varieties of tobacco and establishing cigarrette manufacturing industry, and also of establishing sizing industry from maize, should be carefully explored. Every year these crops are exported in huge quantity to outside places, hence if new markets are created like this, not only the agriculturists will get better price for their crops as new demands for their produce will be created, but, if these new industries come into existence, more people will find outlets for employment.

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* Irrigated in the sense that they receive water mainly from wells. Hence only in this, half a million acres land second crop is possible.

As for the live stock resources of Gujarat we find that the number of cattle per 100 of population is, 84. This is not so encouraging a figure when it is compared to those of the New Zealand, Australia and Uruguay. Moreover, the figure 84 per 100 of population is misleading and exaggerating when we find that in foreign countries faulty animals are destroyed, while, in case of Gujarat, about 10 to 15 percent of the total are old cattle, too old to work or to breed.

We also find a glaring discrepancy between the number of cow buffaloes and male buffaloes in Gujarat. The proportion stands at 874,816 cow buffaloes: 32,744 male buffaloes. This is so because male buffaloes have been ill-treated and got rid off at the earliest opportunity, as it is not possible to utilise their services for agricultural or transport purposes.

Because of this glaring discrepancy in their number, the scientists have often opined that the buffalo should not have been domesticated at all. But today, we can ill afford to follow their advice, owing to the poor milking quality of the cows.

Some ways and means, therefore, be devised to make the male buffaloes more serviceable. Another point which strikes us is the existence of useless, weak, aged animals consuming the fodder much needed by working animals.

Cattle breed needs be improved in Gujarat and for this, the solution can be found in the creation of more grass and pasture lands, by making use of the 2 million acres waste lands of Gujarat.

Sheep and lamb breeding also requires immediate attention of the authorities concerned. Any step taken in this direction will result in the yield of more milk, better quality wool and skins.

In the end we wood like to draw the attention of the

State authorities to the existence of 'Chhikārās' (wild pigs) and 'Rojs' (wild cows) in the different parts of Gujarat. They often destroy the standing crops by running over the fields, and, they are a great nuisance to the peasants. Some steps should be taken in hand, to get rid off these animals, for, if their census is taken, their number is likely to run into lakhs.

TRANSPORTS...

We are surprised to note that in Gujarat, even today, cart transport plays a predominant role as the goods and even passenger carrying agency. It is so, because, out of 10000 miles roads hardly 3000 miles are motorable in fair weather, while others are more or less cart tracts. There are at present about 4 lakhs riding and load carrying carts in Gujarat out of which about 1½ lakhs are the riding carts.

Out of 1720 miles railways in Gujarat, British Gujarat and Baroda State claim for themselves 1469 miles, hence, the remaining 50 percent of Gujarat area is served by hardly 250 miles railways.

Under the circumstances, there is definitely dearth of railways in Gujarat States. Unless and until this swifter means of communication is made available to the interior parts of Gujarat, her forest and mineral resources will simply mark time for their development. Railways will definitely open up new markets for them as they will create new demands.

To-day we find more than 83.3 per cent villages of Surat cut off from communication with the urban areas during the monsoon months. The condition of the smaller and backward Gujarat States in the interior can just be imagined when it is realised that Surat is one of the Districts in British Gujarat which is comparatively more advanced.

Even though, Gujarat's total mileage of railways is 1720 we find these railways being owned by 8 different agencies, hence they are under eight different managements. Under the circumstances overhead expenditure, terminal charges, etc., are bound to increase the burden of the poor consumer. It is, therefore, in the interest of the province as a whole to put their management under unified control.

Another discouraging feature is of the existence of a variety of gauges. This shows that railway construction was taken up in hand in a haphazard manner, otherwise this thing would not have happened.

Moreover, when Gujarat States (excluding Baroda) badly need more roads and railways, we find, that out of 619 miles motorable roads in British Gujarat 370 miles run parallel to railway lines, and, rail-road competition has already ensued in this zone!

This state of affairs cannot be tolerated when it is realised that the interior of Gujarat (about 50 percent of Gujarat's area) is without adequate roads, and not at all connected by railway lines.

As regards the possibilities of developing roadsteads and ports of Gujarat, we have already drawn the attention of the Government of India a little early in Chapter I, while studying the importance of its coastline to this region.

If, therefore, the existence of different political units makes it difficult to evolve a definite well-planned economic policy in the better interests of the province as a whole, it rests with the Paramount Power to step in and chalk out a definite line of action.

HUMAN ELEMENT...

After careful observation of the existing economic resources of Gujarat, it is imperative for us to study the human response to these environments.

Gujarat's area being 33794 square miles and the population 77 lakhs, the density comes to 228 persons per square mile. But if this is the average for the whole of Gujarat, we find comparatively greater density in the British Gujarat and Baroda territories. This proves that the rest of Gujarat is as yet a very backward tract.

There are 103 towns in Gujarat and 12791 villages. Percentage of urban population to rural population comes to 19.81 which proves that bulk of the population lives in villages, and agriculture is their mainstay.*

True to this picture, we find that out of 77 lakhs population 36,90,482 are employed in various occupations, while others are non-working dependents.

The ratio of workers to non-workers is 460 : 540. As for Kathiawar it is 382 : 618. In this respect, Gujarat compares favourably with Kathiawar. From these 36 lakhs workers, agriculture employs about 26 lakhs, while industries about 3½ lakhs. In Gujarat, predominance of agriculture, as the principal source of occupation, is easily brought home to us by the above figures.

One striking feature about Gujarat is that 64 percent of able bodied females augment the family income by some form or other of economic activity, while the corresponding figure for Kathiawar is 43 per cent. This is so because, in Gujarat, per mille of workers employed in agriculture, 245 are cultivating owners and 31 tenant cultivators, while in Kathiawar, per mille of workers employed in agriculture only 67 are cultivating owners and 209 tenant cultivators. Thus more cultivators in Gujarat are the owners of their lands and, therefore, they take more interest in their soils. It seems in this connection, that they find it more convenient to employ their female folks in agriculture.

As for the need for an occupational change, we find 73 percent of the total workers are employed in the exploitation of animals and vegetation and only 10 percent of the total workers are employed in industries.

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*It will be interesting to the note here that, as for the literacy ratio, Kathiawar claims more number of literates per mille of the male and female population when compared to Gujarat.

Agriculture, in its present state, cannot maintain any additional number. New industrial avenues must, therefore, be provided for the growing population of Gujarat. Otherwise it will not be possible to check the steadily increasing number of non-workers in Gujarat, and, the growing poverty of the masses.

(II) INDUSTRIAL RESOURCES

TEXTILE INDUSTRIES...

Of the 77 lakhs population of Gujarat, 350,734 are employed in industries. These persons can be grouped under the following sub-heads:—

(*i*) 125,809 factory workers.
(*ii*) 124,125 artisans.
(*iii*) 108,000 employed in small scale and cottage industries.

Though, Gujarat is comparatively one of the highly industrialised regions of India, the above statistics give us ample proof that 71 percent of the total workers in industries are workers in cottage and small scale industries and artisans.

Textile Mills :

Of the 125,809 factory workers in 1930-31 82,752, and in 1937-38, 1,03,148 are found employed in textile mills. Hence among the large scale industries, textiles have assumed a great importance in the economic life of the people. Of course, there are other factories like a few iron and brass foundries, engineering workshops, hosiery or powerloom factories, but the number of persons employed by them hardly runs into a few thousands. Special requirements and handicaps of the Gujarat's textile mills are:—

(1) Rationalization of the plants. Most of the Textile mills are having old plants and equipment, and

hence, with their inefficient plant, they cannot produce cloth at cheap rate when compared to that of the foreign textile mills.

(2) The mill workers are not trained and, therefore, they do not know how to handle the machinery, or to handle the actual operations, during the processes of spinning and weaving. There is, therefore, an urgent need for opening up adequate number of Industrial or Training Schools for them.

(3) If the Millowners co-operate, and put an order for coal, through their Association in lump quantity, and, store it in their godowns to meet their annual requirements, they will be able to effect a great economy in its purchase.

Census figures show us that out of 1,25,809 employed in textiles, 82,752 are found working in the registered factories and textile mills, remaining 43,130 workers are, therefore, employed in handspinning and handloom weaving in the unregistered factories.

Small Factories: Power Looms: Silk Weaving:

There are 1200 powerlooms in Gujarat engaged mostly in silk and cotton weaving. Most of them are situated at Surat, which claims to have 46 factories with 1081 looms to its credit. Nearly 6000 weavers are employed in this industry at Surat.

Out of these 46 factories, 23 are producing silk goods. Annual production of silk goods at Surat is estimated to be of 70 to 80 lakhs; and the total investment in the plants comes to Rs. 20 to 25 lakhs.

Mostly silk is imported from China and Japan.* In all, raw material worth 40 to 45 lakhs is required by this industry.

This is one of the important industries of Gujarat and hence, it needs careful attention of the State authorities. For the improvement and development of this industry, we make the following suggestions:—

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* Due to war these imports have practically ceased.

(1) Loss in degumming is greater in case of Indian silk, than in the case of Chinese or foreign silk. Hence silkworm breed needs be improved in India.

(2) Indian silk is difficult to wind, because, when re-reeled the Indian silk shows uneven thread. Hence proper sorting and grading should be introduced in its trade.

(3) It is also desirable to give proper denier to the silk, and for this purpose, to open test centres in each and every silk producing region of India.

If the above steps are taken, demand for Indian silk will increase.

(4) At Surat there is an urgent need for establishing a complete dyeing, bleaching and finishing plant. At present a large quantity of cloth is sold in an unfinished or partly finished condition, and hence, the producers do not get the proper price.

(5) In order to increase the efficiency of the workers in these factories, Industrial Training School should be opened at Surat, which can train the workers to handle the powerloom machinery.

(6) A good sales organisation should be established for finding out the ways and means of (*i*) regaining the lost markets (*ii*) extending the interior markets in India and, (*iii*) developing the overseas markets.

(7) Greater interest should be evinced for preparing new designs and patterns in the production of silkgoods.

(8) The Government should impose prohibitive duties on the imports of (*i*) pure silk, (*ii*) art silk and (*iii*) mixed (cotton and silk) goods, as well as, (*iv*) the imports of Japanese fents.*

Hosiery Factories:

Ahmedabad is the leading centre employing 1497 persons in its 8 hosiery factories. The remaining 6 factories in the Bombay Presidency employ only 283 workers. A decade or two ago, no hosiery factories were existing in the Bombay Province and practically the needs of Gujarat were met by Japan and other foreign countries.

These factories produce mufflers, socks, hoses, etc., from cotton, silk and woollen yarn. As such, the industry is unable to meet the demands of our province. There are, therefore, heavy inroads of foreign goods in our markets. Foreign hosiery is found superior in quality, and hence, it is given preference. In order, therefore, to catch our markets, we make the following suggestions for the observation of the hosiery manufacturers: (1) They should take great care to increase the efficiency of (*i*) workers (by training), and the plant (by rationalisation). (2) For producing superior quality goods, they should use better quality stuff (wool). In this connection, sheep and lamb breeding needs be improved in our country.

Handloom Weaving:

There are about 7500 looms in Gujarat. Their number has declined, for, the number of handlooms engaged in weaving silk cloth, 'pitamber', sari, reshmi tanchhoi, patola and sujjani making, and, mashru weaving, etc. have declined.

Pitambers are out of vogue, but the special patterns of Gujarat *viz.* tanchhoi, patola and sujjani weaving have been given up, not due to the competition of some cheap substitutes, but because of the depression and lack of State effort to popularise the same in foreign countries. Sari and mashru, on the other hand, are increasingly produced on machine.

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*As we are at war with Japan, we have at present no trade relations with her.

Wool Weaving:

Wool weavers mainly concentrate on producing blankets. Their blankets are of inferior quality as compared to foreign machine products. Machine goods are also cheap. Hence, blanket making on handlooms is fast given up in Gujarat.

On the other hand woollen galechas are costly. They are, therefore, beyond the reach of the poor masses in India. However, if properly advertised, they are sure to find markets in foreign countries.

Tat weaving or hemp carpet making is carried on in crude fashion, and, the availability of better substitutes have curtailed their demands. In order to popularise their use, they need technical guidance.

Cotton Weaving:

Cotton weaving is under the circumstances, the mainstay of the handloom weavers in Gujarat. In this also, the special patterns like 'ghāghrāpat' of Borsad, 'saragiā' and 'thobh' of Kanodar, 'lungi' of Surat, 'rajjai' or padded quilts of Broach, 'vahānani bori' of Bulsar, 'susi' of Kanodar and Zalod, etc. have been either out of vogue, or else, (*i*) the former markets of these products have been getting them locally made or (*ii*) they are favouring some cheap machine made substitutes.

The demand for cloth buttons and cotton tape or 'patti' have declined to an unprecedented extent. Making of 'jotar', 'nārā', 'gofan', 'mhorā', 'mod', 'āthur', 'pālā', 'poth', 'chhālkā', 'shikkā', etc., is almost fast given up.

Ropes, twines and strings are increasingly produced on machine, and a few factories have recently come into existence in Gujarat. But instead of importing them from outside the province, it is desirable to establish more factories in this region at suitable centres like Ahmedabad, Surat, etc. to cater for the local requirements.

Weaving of mill wastage yarn is now favoured by the handloom weavers and this industry definitely deserves encouragement. However, there is a limit to the availability of the mill waste yarn. This is, therefore, an industry depending upon the output of the textile mills.

Hand woven khaddar is more durable and, therefore, the villagers prefer hand woven cotton 'gaji' to mill 'gaji', however, competition of the powerlooms in, this connection, is sure to tell heavily upon the existence of handlooms in near future.

With the decline in the handloom products, dyeing and calico printing have suffered a great deal. Mostly calico printing and dyeing is now carried on in textile mills, hence most of these cottage workers have been thrown out of employment.

Knot-dyeing has suffered because of the introduction of spray work in textile mills and also on account of their production of the special pattern 'dāriyai moj'.

Mud printing and 'abhrak' work, the specialities of Patan and Rajpur in the hey day of handlooms, are no longer favoured, and, the same is the case with sizing as a cottage industry. Sizing plant is now introduced in the textile mills, hence, the sizers as a class are rendered unemployed.

Gold Thread Industry:

The gold thread industry is largely connected with the textile industry. It is, really speaking, dependent upon textile fabrics. Surat is the chief centre of this industry in Gujarat. About 12000–13000 persons are employed in this industry at this centre, and its annual output of goods is worth 80 lakhs of rupees. Capital invested in this industry is estimated at Rs. 6 to 7 lakhs.

The main jari products of this industry are tiki, katori, chalak, tāsā, salmā and kāngri, while the main 'kasab' preparations are laces and borders of different patterns, and, in addition weaving of kinkhāb cloth.

As this is one of the art crafts, catering for the needs of the rich, it needs special attention of the State authorities. For the development of this industry, we make the following recommendations :—

(1) With the change in the public taste, if embroidered caps have been out of vogue, laces and borders of new patterns should be made. What is, therefore, needed is the expert guidance, and constant efforts, towards making of better designs and patterns.

(2) Detailed investigation into the absorptive capacity of each market should be carried out, and special attention should be given to the price, quality and design of the product.

(3) In this connection, a small bureau should be established at Surat, which should be in charge of a research scholar, who can gather statistics, analyse the trend of the markets, and can help the merchants in studying the marketing conditions, and, in increasing their trade relations.

(4) This research scholar should also be a technician, in touch with the Government Departments, so that he can easily persuade the Government to constantly carry on experiments for improving the technique of this industry.

(5) In order to remove mal-practices, he should be empowered to enforce rules and regulations for the observations of the gold thread manufacturers and dealers.

(6) The Government of India should remove the protection only when this industry is put on a scientific basis, and, half-fine thread manufacturing becomes a huge success at Surat. They must first be convinced of the capacity of this industry to withstand foreign competition.

(7) As silver is one of the principal raw materials required by this industry, import duty on silver should be removed.

WOOD WORK...

The number of persons engaged in wood carving industry is 36,575. Mostly they are carpenters and basket makers. But there are among these artisans, some craftsmen, who have made Gujarat famous for their art of wood carving.

Foremost rank in the art of wood carving can be given to the two artisans, one at Visnagar, and the other at Bansda. Visnagar's artisan carves beautiful figures of camel, buffalo, crocodile, elephant, lion, etc., etc., while the Bansda's artisan is known more for his lacquer work. He makes 'gulābdānis', fountains, electric stands, etc. From 'tumbdā' wood he makes wind instruments like 'mādal', 'tur', 'tuntuniu', etc., and from bamboo roots he makes 'pollo' balls. Both these artisans have earned India-wide reputation for their craftsmanship. But because of the want of proper patronage, the Bansda artisan is living in a very miserable plight.

Surat is a famous centre for sandal wood carving in Gujarat. But only 18 artisans are found at work at this centre, and, they produce Rs. 2000 to 3000 worth goods per year. The demand for sandal wood articles is fast declining and the industry is suffering from acute depression. These sandalwood carvers have earned a name for their artistic and beautifully carved caskets, and for their designs on sandal wood boxes.

They are also noted for their art of inlaying. Because of the lack of proper advertisement of their products, they find their markets being curtailed every year. The same is the fate of the Sankheda lacquer work. The artisans of Sankheda are known for making tin colour. There are about 20 artisans engaged in lacquer work at Sankheda, but only 6 of them know the art of preparing this colour.

Wooden toys made by these artisans and by the artisans of Idar are quite attractive, but they still need greater skill in carving. Only expert wood carvers of Bansda and Visnagar can guide them in this connection. If this skill be imparted to them by the above artisans, Gujarat will become famous for her toy making industry within a few years. The art of wood carving can be patronised only by the rich. The carved articles can fetch good remuneration in those markets, which are visited by the luxury loving people. Hence some State effort is required to popularise these products, in foreign countries.

Visnagar is still famous for temple work in Gujarat. But now only two artisans devote themselves to the carving of the wooden idols, which are usually fixed to the pillars, doors and seats of the dieties in the Hindu temples. As the faith in the idol worship has declined, few new temples are constructed, as a result these artisans receive few orders per year. Under the circumstances, this industry seems to have no future; hence, the craftsmanship of these artisans require to be diverted to some other profitable outlet. Being carvers, they are likely to be the assets to the toy making or furniture making industries, as they can easily improve the designs and patterns. Similarly, among the declining industries in wood carving, are wooden bracelets making, cocoanut bangles making, 'sisam' or blackwood bangles making and (if we include in this group) lac bangles making. Obviously the polished glass bangles have taken their place. Similarly wooden and horn combs making has greatly suffered from the imports and inroads of celluloid and other combs in the Gujarat markets. These combs are, therefore, favoured only by the females in the backward tracts of Panch Mahals, Chhota-Udepur, Devgad Bariya and Jambughoda. Wooden die making has declined with the introduction of calico printing plants in the textile mills of Gujarat.

Cart making is an old established industry of Gujarat. It was one of the important occupations of the urban as well as rural carpenters. But as the automobiles began to ply in the urban areas of Gujarat, cart making and coach making received a set back, and their importance as the passenger and goods carrying agencies is mitigated a great deal with the construction of railways in the province.

Still, however, in the interior Gujarat, carts hold their own and they still occupy important position in the transport system of the province. This can be easily realised when we find, that in Gujarat, there are about 4,00,000 riding and load carrying carts, and, out of her 10000 miles roads, hardly 3000 miles are motorable in fair weather. The remaining roads are, therefore, the cart tracks.

Coaches find the competition of the bus services. They are, however, more convenient vechicles for carrying goods and passengers from railway station to their residence.

Kharadis make wooden cots, but these cots are now found inconvenient in the towns, where people try to accommodate themselves in small premises. In addition, they make toys. But their toy markets are reduced because of the imports of foreign rubber and celluloid toys. Their mainstay is the making of 'ādani' 'velan' and other kitchen requirements. But the demand for furniture is growing.

Furniture making is a growing industry of Gujarat. Even in small towns the carpenters get orders for making chairs, tables, etc. The prominent centres in this connection are Ahmedabad, Baroda, Surat, Godhra, Sankheda, Bulsar and Patan. The main products of these centres are cupboards, tables, chairs, teapoys, cots, cradles, easy chairs, etc. What these furniture makers require is proper guidance for making more polished and attractive articles.

Motor-Body building karkhanas are of recent origin and they are found in the centres like Ahmedabad, Surat, Baroda and Nadiad. Demand for motor-bodies is increasing in Gujarat, as new roads are constructed and bus services multiply their number in the various parts of Gujarat.

About 200 persons are engaged in motor-body building at present, but this industry is likely to develop in the near future. If, therefore, proper steps are taken for the growth and development of this industry, it is likely to meet all the demands of the omnibus-bodies of Gujarat.

There is only one bobbin making concern in Gujarat (at Navsari, in Baroda State), which is manufacturing bobbins and wooden articles required in the textile mills and ginning factories. If the State evinces concern in this industry by reducing freight charges and customs duties on the imports of wood, and, helps this concern to obtain motive power at cheaper rate, this industry will develop a great deal.

METAL WORK...

The total number of metal workers is 15,385 in Gujarat. Most of these workers are either blacksmiths or brass and copper smiths.

In the pre-era of the Industrial Revolution, as all the utensils and other household requirements were made on cottage basis, some centres of Gujarat had earned special reputation for their particular articles. In those days of cottage crafts, manufacturing of razors, nut crackers, knives, brass ornaments, kathir bangles, bell metal goods, iron gallery frames, etc. etc., were the specialities of particular centres of Gujarat. But with the production of better articles on machine, importance of cottage crafts, for razors, nut crackers, and knives making, have dwindled into insignificance, while better quality cheap glass and other bangles have nullified the importance of brass ornaments. Kathir bangles and kathir ornaments, which, in the beginning, acted as a substitute for the brass ornaments, in their turn, began to feel the competition of alluminium and other cheap and superior quality articles. Bell metal utensils are practically out of vogue, while iron gallery frames are now manufactured at the various centres in India, hence Lunawada's importance has greatly suffered in this connection.

Promising iron industries with bright prospects are the (1) trunks, (2) safes, (3) cupboards, (4) tins and (5) mill machinery parts manufacturing. In this connection Ahmedabad happens to be the leading centre of Gujarat, before which all other centres fade into insignificance. These are the new industries of recent origin, and as such will develop in the near future. Especially the mill machinery parts manufacturing has bright prospects. If the State begins to evince interest in this industry, Gujarat will have no need to depend on foreign countries for her requirements of mill machinery parts. However, English pinions and twist wheels, etc., are considered of superior quality, more even, and accurate in weight, which is not the case with our indigenous articles. Hence, the manufacturers of mill machinery parts should take greater care to see that they produce better quality articles.

Brass and copper utensils are now increasingly produced in factories. As such, we have carried out the investigation into the conditions of these artisans in details. What appeals to us, is the necessity of introducing (1) polishing machinery and (2) the art of tinning the vessels at suitable centres like Visnagar, Nadiad, etc.

The goldsmiths feel that (1) more polishing shops should be establishsd in Gujarat, and, that (2) the art of making dies of different designs should be taught to them. They also require machinery for (*i*) making 'tiki' and (*ii*) for drawing the wires.

LEATHER INDUSTRIES...

The total number of workers in leather is 20550, and, the important class under this head is of the tanners and shoe makers.

Before the iron tins were available the 'Dabgars' all throughout Gujarat, used to make 'Kullas' or leather containers. But this industry is now practically extinct.

New industries which have come into existence of late are: (*i*) roller skins, (*ii*) pickers, and (*iii*) washers manufacturing.

Roller skins are manufactured at Ahmedabad as there is a local market for them. They are required by the textile mills. As large quantity of the roller skins is imported in our country, there are all the chances for this industry to develop at Ahmedabad, provided the manutacturers improve the quality of their product.

Similarly pickers manufacturing deserves greater attention. As about 12000 gross pickers valued at Rs. 3,10,000 are produced per year at Ahmedabad, even the size of their growing industry should induce the States to evince keen interest in its well-being. English pickers are of even size, superior in quality, and more durable. The Ahmedabad manufacturers should, therefore, make special efforts to produce better quality pickers.

About 70 per cent of Ahmedabad's pickers find markets in Northern India and only 30 per cent are sold locally. Under the circumstances every year there is heavy inroad of foreign pickers in the Ahmedabad markets. Hence, all possible technical guidance should be given to the pickers manufacturers.

The manufacturers themselves are enthusiastic and have enough financial resources. They want to purchase (1) a roll to press the hides for making it even in size and (2) a press to cut the hides into even pieces. If they are properly guided in these directions; they are quite confident of ousting the foreign imports from the Indian markets.

The future is bright and promising for this industry; and much of the mal-practices will be removed if the Association or the Sales Organization of the pickers manufacturers is established at Ahmedabad, which can lay down the rules and regulations to be observed by the pickers manufacturers. Instead of selling the mixed quality pickers, sorting and grading should be enforced immediately in order to earn the trade reputation.

It is often complained that in their impatience to sell the goods quickly, the pickers manufactures do not allow the pickers to mature properly in sperm oil. This defect should be mitigated in the early stages of the development of this industry in order to ensure and widen its markets.

Washers manufacturing is likewise an industry having good potentialities. Annual output of Gujarat is estimated at Rs. 2,70,000 and 288 persons are employed in this industry.

Chrome composite washers are successfully competing with the indigenous tanned hides washers. Hence a number of tanners have been rendered unemployed.

Either the use of the 'deshi' washers should be encouraged by the State, in order to increase the demand for the tanned hides, or, it should take steps to see that the chrome tanning is introduced in this region so that chrome wastage is made available to the washers manufacturers at cheaper rate.

Something like Rs. 1,50,000 worth chrome wastage is imported every year by the Nadiad and Broach karkhandars, and if orders for tanned hides are given to the local tanners for the same amount, about 900 other families will be maintained by this industry. Under the circumstances, all possible steps should be taken, (1) for stopping the mal-practices of the tanners of adding salt to the tanned hides, and (2) for improving their quality by making the use of better knife, beam, etc. In this connection a good organization should be set up by the Government to check their mal-practices and to render them expert guidance.

FOOD AND DAIRY INDUSTRIES...

The industries mentioned under this head are of primary requirements to mankind. As such their size is determined by the extent of growing population and its needs. However, the existence of the Roller Flour Mills, and, side by side of the Small Flour Mills, and, the Hand Grinding Mills, foretell us the existence of intense competition in the rates charged by them. Naturally hand grinding is at a disadvantage, when machine grinding has come into existence.

One of the demands of the hand-mill grinders is to stop completely the operation of the flour mills from the rural areas. Generally the hand-mill grinders are the females, belonging to the poor classes. As long as the social conditions in Gujarat do not change, and, widows as a class remain into existence, they find a good source of livelihood in hand-mill grinding. This is a healthy occupation for them and it does not require them to stir out of their houses, which is still necessary for many orthodox families believing in purdah system. Their independence is assured in this occupation. Their demand has, therefore, some justification. This is one of the important female occupations in Gujarat, and, as such, the State will be justified in allowing it to remain on handicraft basis at least in rural areas.

The artisans who are producing the articles of primary or the basic requirements of Man demand that, articles of luxuries should be produced on machine, so that, they might be available at cheaper rates to mankind, while the articles of basic necessities, which they produce, should be allowed to remain on handicraft basis. In this case handloom weavers, brass and coppersmiths, corn grinders, oil crushing ghani owners, in short, those artisans connected with food, clothing (textiles), metal and leather industries will benefit a great deal.

If machinery is to be a labour saving device, and not a labour displacing agency, the social thinkers have got to see that the State policy results in the employment of all the workable hands in the various occupations, and that, enough provision is made for the growing population. If the labour appreciates, the foundations of the State will be strengthened, while, if the labour suffers, the foundations of the State will be undermined. If so, no amount of propaganda work, even though it might be carried out with spiritualistic fervour, will save it from ruin.

Existence of a handloom, a powerloom, and a textile mill in the same region foretell the existence of a large scale, small scale, and, a cottage industry. They produce the same goods and put them in the same markets. There arises unhealthy and unfair competition between these three systems of production, which requires to be checked and prohibited. Under the circumstances, is it too much to demand from the State, to see that it plans out and controls the entire productive activity by devising suitable measures ?

We earnestly feel that first of all the State should take up the problem of the textile, metal, and, leather industries, and immediately stop the unfair competition, which is existing in some of their products, by proper distribution of the fields of production. Healthy competition between the three systems is welcome since it would provide considerable stimulous, (*i*) for increasing the efficiency and also (*ii*) for rationalising the production. Hence, we are not at all for abolishing either of the systems run by hand or other motive power, but, what is needed is the proper distribution of the fields of production.

From among the food industries, ghee and casein making industries draw our special attention. Mal-practices existing in the trade of ghee, *i.e.* mixing of vegetable ghee and animal fat, etc., should be completely stopped. All the steps should be taken for the proper development of this industry; for, this product of milk is made even in the villages remote from the swifter means of communications. It is also one of the principal articles of food of Man.

From casein, possibilities of manufacturing rain coats and other water proof materials should be explored. If this is found feasible, or if some industrial use of this product can be made, with the widening of its markets, the size of this industry will develop a great deal.

Moreover, there is a need of establishing more dairy farms and creameries on scientific basis in the various centres of Gujarat. Butter and cheese making afford good markets and in this province, we find sufficient waste lands and forest areas, which can be used for growing fodder like turnips, clover, grass, etc. This will be a double blessing to this region. Not only the size of butter, cheese, ghee and allied industries will increase, but, because of the improved cattle breed, better quality hides will also be made available to the leather industries.

OTHER INDUSTRIES...

Among the remaining industries, we find greater scope for the development of the match industry, chemical and pharmaceutical industries, fishing, ink manufacturing, ivory and alkali works etc. Agate stone carving and ivory work also need the attention of the State authorities, while the other industries like arrow and bow making, ' kulla ' making, etc. are fast declining, as they are now out of place, and, the requirements of the times.

In our findings, we are able to make many valuable suggestions for the economic and industrial development of the province. There is no reason, therefore, for the masses of this region to despair. Even if the suggestions made by us are worked out in broad outlines by the State Authorities, not only they will give employment to a sufficiently large number of people, but they will also develop the Wealth of Gujarat a great deal. Vast resources are at the disposal of the people of this province and they are capable of further development. In their development will, therefore, lie the solution of the misery-stricken masses of the province, and then and then only its people will be able to live a fuller and richer life.

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APPENDIX
TABLES

CHAPTER I. TABLE NO. 1.

Table giving the Rainfall figures as recorded in the different parts of Gujarat, for the years 1927—28 to 1937—38.

Station where Recorded	1927-1928	1928-1929	1929-1930	1930-1931	1931-1932	1932-1933	1933-1934	1934-1935	1935-1936	1936-1937	1937-1938
*Palanpur ...	...	28.38	23.7	33.38	24.36	55.72	38.66	22.39	12 72	52.66	23.59
*Radhanpur ...	26.44	12.33	17.44	21.66	21.51	20.80	18.02	10.37	6.84	...	...
*Baroda ...	73.23	38.52	27.86	40.59	51.68	38.81	48.82	37.11	34.9	27.35	44.29
* {Kadi ...	51.88	22.80	...	...	...	...	...	...	...	...	...
{Mehsana ...	...	...	18.13	23.22	28.89	25.98	37.48	30.10	16.78	14.45	38.94
*Mansa ...	49.23	28 67	22.2	27.90	47.65	25.38	...	...	...	...	...
*Ilol ...	40.44	25.30	17.43	24.48	42.7	...	...	...	...	...	...
*Balasinor ...	62.41	38.36	31.36	42.7	43.97	32.83	46.70	53.34	26.34	16.71	...
*Lunawada ...	47.36	36.37	20.72	35.43	41.6	26.47	34.7	37.68	12.25	38.2	25.94
*Rampur (Santrampur) ...	...	...	31.98	41.67	58.50	27.11	48.59	34.90	23.55	16.85	36.15
†Ahmedabad ...	...	35.74	23.64	32.46	39.01	42.76	47.93	29.04	22.72	22.19	40.68
†Kaira ...	...	27.12	22.91	37.17	31.74	31.36	39.40	37.27	21.33	20.80	34.36
†Godhra ...	...	50.96	41.34	57.73	59.31	39.55	52.48	49 77	38 41	24.49	49.18
†Broach ...	...	35.03	35.26	33.20	34.78	28.15	25 50	31.15	20.71	25.11	28.40
*Jambughoda ...	...	...	...	...	...	40.94	52.15	...	...	...	...
*Rajpipla ...	59.45	30.43	30.07	38.08	46.43	37.41	32.65	32.75	...	...	...
†Surat ...	...	30.44	55.42	44.05	53.24	44.90	50.90	51.09	40.99	27.81	64.93
*Navsari ...	45.70½	40.84½	49.23	54.16	69.92	62.32	54 33	52.21	47.53	42 62	63.30
*Bansda ...	...	...	...	...	...	...	75.25	66.71	57.77	...	...

* Figures taken from the Administration Report of the States concerned.

† Figures taken from the Season and Crop Reports of the Bombay Province for the years concerned.

CHAPTER I. TABLE No. 2.

Table giving the Value of the Import and Export Trade carried on by the Minor Ports of Gujarat during the years 1932–33 to 1936–37.

PORTS	Year 1932–33 Value in 000's Rs.		Year 1933–34 Value in 000's Rs.		Year 1934–35 Value in 000's Rs.		Year 1935–36 Value in 000's Rs.		Year 1936–37 Value in 000's Rs.	
	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export
Cambay ...	19,62	18,18	10,95	15,57	9,86	3,77	3,35	9,20	7,80	9,53
Broach ...	36,25	115,33	41,32	73,35	48,51	20,98	49,42	32,18	39,06	48,71
Surat ...	22,71	8,92	27,50	93,93	40,38	11,69	41,41	12,22	29,73	10,79
Bulsar ...	9,02	8,45	8,24	7,75	9,96	7,34	10,09	8,63	11,71	7,96
Total ...	87,60	150,88	88,01	190,60	108,71	43,78	104,27	62,23	88,30	76,99

N. B.—This table has been computed from the figures obtained from the Bombay Minor Ports Committee Report 1939 and the Cambay State Administration Reports for the years 1932–33 to 1936–37.

CHAPTER I. TABLE No. 3.

Table giving the Sea-borne Trade of the Minor Ports of Gujarat during the years 1932–33 to 1936–37.

Ports	Year 1932–33 Value in 000's Rs.	Year 1933–34 Value in 000's Rs.	Year 1934–35 Value in 000's Rs.	Year 1935–36 Value in 000's Rs.	Year 1936–37 Value in 000's Rs.
Cambay ...	37,80	26,52	13,63	12,55	17,33
Broach ...	151,58	114,67	69,49	81,60	87,77
Surat ...	31,63	121,43	52,07	53,63	40,52
Bulsar ...	17,47	15,99	17,30	18,72	19,67
Total ...	238,48	278,61	152,49	166,50	165,29

N. B.—This Table has been computed from the figures obtained from the Bombay Minor Ports Committee Report 1939 and the Cambay State Administration Reports 1932–33 to 1936–37.

CHAPTER I. TABLE No. 4.

Table giving figures of the Sea-borne Trade of Cambay carried on with the Ports of Madras and Bombay during the quinquenium 1802–1806.

Year	Imports from Madras and Bombay Value in Sicca Rupees	Exports to Madras and Bombay Value in Sicca Rupees	Total Sea-borne trade with Madras and Bombay Value in Sicca Rupees
1802	60,78,377	73,53,135	134,31,512
1803	36,63,894	56,25,184	92,89,078
1804	68,18,485	67,78,323	135,96,808
1805	75,72,819	79,22,128	154,94,947
1806	84,93,828	84,26,310	169,20,138
Total ...	326,27,403	361,05,080	687,32,483

N. B.—Figures taken from Oriental Commerce Volume the First by William Milburn, Esq, of the Honourable East India Company's Service, 1813.

CHAPTER I. TABLE No. 5.

Table giving the Sea-borne Trade of Surat and adjacent Villages with Fort St. George and Bombay for the quinquenium 1802–1806.

Year	Total Imports from Fort St. George and Bombay Value in Sicca Rupees.	Total Exports to Fort St. George and Bombay Value in Sicca Rupees.	Total Sea-Borne trade of Surat and adjacent villages with Fort St. George and Bombay Value in Sicca Rupees.
1802	23,51,370	14,40,830	
1803	17,56,407	9,74,122	
1804	33,66,540	13,51,368	
1805	34,46,686	24,31,123	
1806	31,67,740	34,54,172	
Total	140,88,743	86,51,615	

N. B.—Figures obtained from Oriental Commerce Volume the First by William Milburn, Esq., of the Honourable East India Company's Service 1813.

CHAPTER I. TABLE No. 6.

Table giving the exports from Surat to the Gulfs of Persia and Arabia for four years 1794–95 to 1797–98.

Years	Arabian Gulf	Persian Gulf	Total
	Rupees qr. reas	Rupees qr. reas	Rupees qr. reas
1794–95	3,34,734–0–80	2,09,601–1–40	5,44,335–2–20
1795–96	2,82,970–2–70	3,14,386–3–80	5,97,357–2–50
1796–97	5,22,527–0–45	3,52,119–1–00	8,74,646–1–45
1797–98	3,45,657–0–86	2,45,381–2–80	5,91,308–2–66

N. B.—Figures obtained from the Oriental Commerce Volume the First by William Milburn, Esq., of the Honourable East India Company's Service, 1813.

CHAPTER III

Analysis Reports of some of the Mineral Finds of the Idar and the Rajpipla States.

SABARVALLEY KAOLIN INDUSTRIES

Refiners and Manufacturers of China Clay for Textile and Paper Industries

Factory
ARSODIA,
Idar State, P. O. Davad,
JADAR, A. P. Rly.

Proprs.
Somnath B. Bhatt & Co.
AHMEDABAD.

HUGHES AND DAVIES

Mining Engineers, Metallurgists, Assayers,
Analytical Chemists, and Cement Testers, Etc.

No. D. 3267
101, Esplanade Road,
Fort, BOMBAY,
21-3-40.

(Copy)

CERTIFICATE

We hereby certify that a sample of China Clay (lavigated) received by us on 19-3-40 from M/s. Somnath B. Bhatt & Co. has been analysed with the following results·—

Marked :—"Everest Brand"

China Clay—Sample received from

M/s. Sabarvalley Kaolin Industries, Arsodia, Idar State.

		Per Cent.
Silica	SiO_2	45.72
Alumina	Al_2O_3	40.32
Ferric Oxide	Fe_2O_3	0.35
Lime	CaO	Trace
Magnesia	MgO	0.50
Chlorine	Cl_2	Trace
Moisture	H_2O	0.64
Combined Water		12.47
		100.00

Fineness	97.7% passes through 200 I.M.M.Std Sieve.
Grit	Nil
Feel	Good
Colour	Good

This is an average good quality China Clay

Sd/- J. F. DAVIES.

• • •

HUGHES AND DAVIES

Mining Engineers, Metallurgists, Assayers,
Analytical Chemists and Cement Testers, etc.

No. D2185
101, Esplanade Road,
Fort, BOMBAY,
13-3-39

CERTIFICATE

We hereby certify that a sample of China Clay received by us on 3–3–39 from the Aklera China Clay Works, has been analysed with the following results:—

Marked 1st Quality China Clay—"Aklera Brand"

Silica	SiO_2	45.34%
Alumina	Al_2O_3	39.38%
Ferric Oxide	Fe_2O_3	0.34%
Titanium Oxide	TiO_2	1.70%
Lime	CaO	Trace
Megnesia	MgO	Trace
Moisture	H_2O	1.22%
Combined Water		11.90%
Alkalies, etc.		0.12%
		100.00

This is a good quality of China Clay.

Sd/- J. F. DAVIES.

• • •

Analysis report on Aklera, Idar State, China Clay by Mr. N. P. Gandhi, Head of the Department of Mining and Metallurgy, Benares Hindu University.

Salica	(SiO_2)	45.16	Magnesia	(MgO)	0.13
Iron Oxide	(Fe_2O_3)	0.70	Alkalies	(Na_2O & K_2O)	0.72
Alumina	(Al_2O_3)	39.75	Loss on ignition etc.	H_2O,CO_2	12.60
Lime	(CaO)	0.94			
					100.00

From the above you will please see that it comes very close to that of British China Clay.

• • •

Analysis report of Idar Granite, Idar State, by Dr. Christie of the Geological Survey Laboratory.

(Hornblende Variety)

Kawa.

SiO_2	66.04	TiO_2	.69
Al_2O_2	14.77	ZrO_2	.03
Fe_2O_2	1.18	CO_2	...
FeO	4.41	P_2O_5	Trace
MgO	0.98	Cl	Trace
CaO	2.95	SO_3	Trace
Na_2O	2.56	Cr_2O_3	...
K_2O	5.25	MnO	.11
H_2O (below 108°C)	.21	BaO	.02
H_2O (above 108°C)	.71	SrO	Trace
			99.91
		Specific Gravity ...	2.72

• • •

Analysis report on Talc (French Chalk) of Nairanpur, Idar State, by Hughes and Davies, Bombay.

Salica (SiO_2)	59.46	Magnesia (MgO)	32.23
Alumina (Al_2O_2)	1.20	Free and Combined Water H_2O	6.15
Ferric Oxide (Fe_2O_2)	0.38	Alkalies, etc.	0.13
Lime (CaO)	0.45		
			100.00

This quality French Chalk would be suitable for Textile and General Industrial purposes.

• • •

Analysis report on Asbestos of Idar State by Mr. H. S. Bion, of the Geological Survey of India.

Ign H_2O	1.52	CaO	12.15
SiO_2	55.54	MgO	21.27
Fe_2O_3 Al_2O_3	8.35	Loss	1.17
			100.00

The iron and Alumina have not been separated and a little Manganese is present.

• • •

Analysis report on Manganese Ore found in Idar State, by Hughes and Davies, Analytical Chemists and Cement Testors, 101, Esplanade Road, Fort, Bombay.

Manganese 52.48 %

• • •

Analysis Reports of the Rajpipla Clays as tested by Mr. B. Oates, I.M.E.

(1)	BHILOD	Volatile Matter	13.80 %
		Silica	45.20 %
		Aluminium Oxide (Al_2O_3)	27.80 %
		Iron Oxide (Fe_2O_3)	14.16 %
			100.96 %
(2)	BHILOD	Volatile Matter	14.11 %
		Silica	48.28 %
		Aluminium Oxide	29.88 %
		Iron Oxide	6.34 %
			98.61
(3)	VASNA	Volatile Matter	19.31 %
		Silica	44.00 %
		Aluminium Oxide	20.08 %
		Iron Oxide	12.48 %
		Magnesia	Trace
			95.87

Of the above analysis Damlai is the better clay owing to the smaller percentage of Iron. Effort must be directed to find a deposit low in iron which is disastrous to pottery manufacture. The above clays are suitable to tile production.

Sd/–B. OATES, I.M.E.

Tajmahal,
17–4–29

CHAPTER IV. TABLE NO. 1.

Table giving the Cultivated Areas and Cultivable Land lying idle in Gujarat.

PART I[2]

Year	State	Land not available for cultivation	Cultivable waste other than fallow	Current fallow	Net area sown
1936-37	**British Districts of Gujarat:**				
	Ahmedabad ...	497,469	77,067	2,77,030	1,604,846
	Kaira ...	157,380	15,523	28,372	832,181
	Broach & Panch Mahals	364,677	100,270	127,098	1,170,610
	Surat ...	176,654	44,942	21,166	769,253
1936-37	**Baroda State:** (Amreli & Okhamandal excluded)				
	Baroda ...	172,106	91,314	...	930,469
	Mehsana ...	232,085	297,698	...	1,330,995
	Navsari ...	295,366	152,166	...	513,029
	Other Gujarat States:				
1936-37	Dharampur ...	12,712	141,108	...	137,727
1936-37	Sachin ...	1,945	4,810	625	21,302
Total area of Gujarat in acres 21610720	Total area of the above territories in acres 11,360,640	1,910,394	924,898	454,291	7,310,312

PART II[3]

1935-36	Radhanpur ...	Talpad	* 193,967	...	169,616
		Pasaita	* 19,640	...	43,684
1931-32	Ilol ...		* 541	...	16,016
1937-38	Sant State ...		* 15,554	...	90,870
1935-36	Bansda ...		* 12,725	...	51,116
Total area of these States in acres:—1,132,160			242,427	...	371,302
Total area in acres Parts I & II combined:—12,492,800			1,166,325	...	7,681,614

1. Figures taken from the Agricultural Statistics of India 1936-37 Volume I and II.
2. Current fallows included.
3. Figures taken from the Administration Reports of the States concerned.

* Cultivable waste or Cultivable land lying idle.

N. B. This table gives the figures for more than 57 per cent area of Gujarat.

CHAPTER IV. TABLE NO. 2.

Table giving the figures of the Irrigated Land of the various States of Gujarat.

**Area (in acres) irrigated in various parts of Gujarat.*

Year	State	Government Canals	Private Canals	Tanks	Wells	Other Sources	Total
1936-37	**British Districts of Gujarat:—**						
	Ahmedabad ...	59	298	378	54,625	2,533	57,893
	Kaira ...	601	...	445	31,432	766	33,244
	Broach and Panch Mahals ...	161	...	70	4,055	155	4,441
	Surat ...	...	...	1,042	6,377	83	7,502
	Gujarat States:—						
1936-37	Baroda State (Amreli and Okhamandal exclued)						
	Baroda Division	...	...	176	22,502	531	23,209
	Mehsana Division	...	...	...	1,10,293	...	1,10,293
	Navsari Division	159	...	...	3,741	47	3,947
1936-37	Dharampur ...	...	...	...	126	...	126
1936-37	Sachin ...	...	...	1,063	1,175	...	2,238
	Total ...	980	298	3,174	2,34,326	4,115	2,42,893

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* Figures taken from the Agricultural Statistics of India 1936-37, Volume I and II.

CHAPTER IV. TABLE NO. 3.

Table giving the Acreage of Land under the Cultivation of the Main Crops in the various States of Gujarat.

State or District	Bajro-Millet	Juwar	Wheat	Rice	Cotton	Oil-Seeds	Tobacco	Grams and Pulses
British Gujarat[1] ...	333,443	719,473	219,503	212,519	1,258,967	300,296	74,520	468,473
Baroda[1] (excluding Amreli and Okhamandal) ...	419,647	586,071	61,618	176,137	845,340	189,166	48,332	359,759
Palanpur[2] 1937-38 ...	...	...	...	...	2,962	...	...	...
Radhanpur[2] 1935-36 ...	7,514	55,301	28,418	...	40,227	5,429	...	525*
Cambay[2] 1937-38 ...	16,160	22,657	58,886	4,690	16,163	1,555	2,804	...
Lunawada[1]	...	...	...	...	3,695	...	...	...
Rajpipla[2]	7,334	39,304	957	28,908	†129,115	4,380	4,088	21,645
Dharampur[1]	...	...	...	22,420	1,910	610	...	112,661
Sachin[1]	27	5,340	...	1,063	6,554	593	11	695
	782,125	1,422,146	369,382	445,737	2,304,933	502,029	129,755	963,758

TOTAL 6,919,865 ACRES OF LAND.

1 Figures taken from Agricultural Statistics of India 1936-37, Volume I and II.

2 Figures taken from the Administration Reports of the States concerned.

* Grams only.

† 1027 A.L.F. Cotton—There is compulsory sowing of 1027 A.L.F. variety in Rajpipla.

CHAPTER IV. TABLE NO. 4

Table showing the Acreage under the Cultivation of Minor Crops in the various States of Gujarat

State or District	Ragi or Marna	Barley	Condiments and spices	Sugar Cane	Fruits and vegetables including root crops	Miscellaneous
*British Gujarat ...	36,635	6,262	7,456	5,899	26,197	...
*Baroda (excluding Amreli and Okhamandal) ...	19,765	2,722	15,746	1,635	13,263	...
†Radhanpur 1935-36	...	...	...	...	...	32,202
†Cambay 1937-38 ...	...	...	...	...	...	3,880
†Rajpipla 1934-35 ...	...	...	...	...	1,858	46,818
*Dharampur ...	...	...	...	126	...	...
*Sachin ...	...	...	...	25	...	...
	56,400	8,984	23,202	7,685	42,844	82,900

GRAND TOTAL 2,22,015 ACRES.

N. B.—This table gives the figures of about 63 per cent area of Gujarat.

A Note on the Remaining Crops Cultivated in the Various States of Gujarat.

Table No. 3 clearly shows that the principal commercial crops of Gujarat are cotton, and oil seeds (grown in more than half a million acres). Next in importance of these two commercial crops are the food crops and pulses mostly required for local consumption. These crops cover something like 7 million acres of land. Among the remaining crops sown in these areas are: (1) the fodder crops and (2) the Maize crop. Fodder crop is cultivated in about one million acres, while the maize crop in 1,32,062 acres. They are cultivated in the various States as follows:—

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*Figures taken from the Agricultural Statistics of India 1936-37 Volumes I and II.

†Figures taken from the Administration Reports of the States concerned.

(1) *Area under Cultivation of Fodder Crops*

British Gujarat	736,818	acres
Baroda (excluding Amreli and Okhamandal)	83,106	do
Sachin	6,743	do
	826,667	

(2) *Area under Cultivation of Maize Crop*

British Districts of Gujarat ...	1,31,188*	acres
Baroda (excluding Amreli and Okhamandal)	274	do
	1,32,062	

As regards maize crop, the figures of the States like *Lunawada, Sant Balasinor, and Mansa,* etc., are not available to us. But looking to the importance of maize crop in those areas, we can confidently predict that about 3 lacs acres land is under maize cultivation in Gujarat.

Other minor crops, about which figures are available to us are Ragi or Marma, Barley, Condiments and Spices, Sugar Cane, Fruits and Vegetables including root crops and miscellaneous products. Thus Table No. 4 gives the acreage under the cultivation of the minor crops in the various States of Gujarat. About ¼ million acres land is occupied by these miscellaneous crops in this table. But miscellaneous crops cover a wide field as they include, Banti, Bavto, Kodra, Morio, Nagli, Kalthi, etc. If, therefore, the remaining States like Sant, Lunawada, Chhota-Udepur, Devgad Bariya, etc., etc, have been taken into account, they are likely to give us half a million acres under the cultivation of these crops in Gujarat.

Figures given in the Table No. 3 and 4 cover about 63 per cent of the whole territory of Gujarat. They give us the exact idea about the 9 million acres land cultivated under different crops in these areas. Administration Reports of the other States like Sant, Ilol, Mansa,

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*(Out of 1,31,188 acres 1,23,830 acres go to the credit of Broach and Panch Mahals.)

Bansda, Balasinor, etc., give us enough clue that within their territories mainly food crops are grown, and, most of these crops are meant for home consumption. Hence, we can easily realise that under the remaining 5 million acres having more or less similar characteristics, food crops, fodder, oilseeds and tobacco play important role in cultivation. We have obtained precise statistics of about 9 million acres, and the clue given to us by (*a*) the Administration Reports of some of the remaining States like Mansa, Ilol, Sant, Lunawada, etc., and also (*b*) by the statements recorded from the Revenue Officers of some of the States by personal approach, leads us to form the following estimate of the total acreage of land, under cultivation of different crops in Gujarat.

Crops	Data Obtained acres	Estimate of acres in the remaining acres	Total
Under Food Crops (pulses included) ...	3,70,00,000	1,50,00,000	6,00,00,000
Under Rice	50,00,000	30,00,000	
Under Fodder	1,00,00,000	1,25,00,000	2,25,00,000
Under Minor Crops (specified in Table No. 1 at the end of the Chapter) ...	25,00,000	25,00,000	50,00,000
Under Cotton	2,30,00,000	70,00,000	3,00,00,000
Under Oilseeds	50,00,000	50,00,000	1,00,00,000
Under Maize	1,30,000	1,30 000	2,60,000
Under Tobacco	1,30,000	1,30,000	2,60,000
	8,27,60,000	4,52,60,000	12,80,20,000

CHAPTER IV. TABLE NO. 5

Table showing the Area (in acres) under Oilseeds cultivation in the various States of Gujarat.

Year	District or State	Lin-seed	Sesa-mum (til)	Rape and Mustard	Ground nut	Cocoa nut	Castor	Others	Total
*1936-37	British Gujarat ...	135	67,860	15,131	184,864	13	30,634	1,659	300,296
*1936-37	Gujarat States:— Baroda (Amreli and Okhamandal excluded)	...	25,932	21,029	32,042	...	106,124	4,039	189,166
*1936-37	Dharampur ...	...	...	...	...	...	610	...	610
*1936-37	Sachin ...	...	...	...	585	...	8	...	593
								Oilseeds	
†1935-36	Radhanpur ...	...	...	...	...	...	...	5,429	5,429
†1937-38	Cambay ...	...	...	...	...	...	...	1,555	1,555
†1934-35	Rajpipla ...	...	2,744	...	...	...	1,636	...	4,380
	Grand Total ...	135	96,536	36,160	217,491	13	139,012	12,682	502,029

GRAND TOTAL 502,029

N. B.—This Table gives the statistics of about 63 per cent area of Gujarat.

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*Figures taken from the Agricultural Statistics of India 1936-37 Volumes I and II.

†Figures taken from the Administration Reports of the States concerned.

CHAPTER

TABLE

LIVE STOCK

Year	District or State	Bulls and Bullocks	Cows	Calves young stock	Male Buffaloes
1934-35	British Districts of Gujarat	571,170	290,230	322,673	8,164
1936-37	Baroda (Amreli and Okhamandal excluded)	394,360	178,628	104,688	10,847
1936-37	Dharampur	30,476	26,072	...	2,984
1936-37	Sachin	3,226	1,378	121	65
1934-35	Palanpur	68,614	60,366	53,102	1,828
1934-35	Idar	51,742	63,532	29,175	...
1934-35	Vijayanagar	3,844	6,191	3,868	72
1935-36	Radhanpur	15,630	36,135	Information not available	165
1937-38	Cambay	15,480	10,309	...	1,322
1932-33	Mansa	1,878	261	...	47
1931-32	Ilol	1,109	913	...	58
1936-37	Balasinor	14,265	9,119	...	3,805
1937-38	Sant State	30,399	16,888	...	1,357
1934-35	Rajpipla	44,300	26,329	25,964	197
1935-36	Bansda	17,330	13,150	...	1,607
1933-34	Jambughoda	3,081	1,595	...	226
1937-38	Lunawada	Separate		Figures	
	Grand Total	1,236,904	741,617	539,591	32,744

N. B.—This Table represents the conditions of about 76.5 per cent area of Gujarat. This Table has been computed from the Agricultural Statistics of India Volumes I and II 1936-37 and the Administration Reports of the States concerned.

IV.

No. 6

RESOURCES OF GUJARAT

Cow Buffaloes	Buffalo Calves young stk.	Sheep	Goats	Horses and Ponies	Mules	Donkeys	Camels	Total
385,668	352,111	118,875	341,230	18,582	93	23,057	2,372	
331,224	181,531	99,344	199,309	10,622	206	24,238	5,238	
4,086	...	18	426	54	...	...	...	
2,619	199	1,024	3,301	75	...	...	...	
48,779	28,760	23,872	73,154	3,101	...	6,591	4,155	
30,281	12,356	43	152	*1,424	...	2,801	424	
2,218	1,125	Infor	matio	n not	avai	lable		
8,630	Information not available	21	348	1,201	Information not available	1,596	Information not available	
19,972	do	6	220	515	do	674	do	
2,083	do	2	260	47	do	561	do	
925	do		939	81	do	34	do	
7,187	do	6	968	772	do	951	do	
13,064	do	12	805	630	do	642	do	
14,060	8,963	28	108	1,751	do	398	do	
3,344	...	7	115	120	do	†	do	
671	...	1	900	179	do	12	do	
not	given	but t	he st	rengt	h is g	iven	as	97,539
874,816	585,045	1,009	350	39,154	299	61,555	12,373	97,539

*Mares' Statistics not included

†Information not available.

CHAPTER V. TABLE NO. 1.

Table giving the Riding and Load Carrying Carts in British Gujarat, Baroda, and Some of the remaining Gujarat States.

Year	State or District	Carts
1934–35	Ahmedabad District	26,240
do	Kaira District	31,509
do	Broach and Panch Mahals ...	35,623
do	Surat District	46,565
	A. Total British Gujarat	**1,39,937**
1936–37	Baroda	32,807
do	Mehsana	33,005
do	Navsari	24,108
	B. Total Baroda (Amreli and Okhamandal excluded)	**89,920**
1936–37	Dharampur	2,318
1936–37	Sachin	1,279
1934–35	Palanpur	8,708
1934–35	Idar	3,102
1934–35	Vijayanagar figures not available	...
	C. Total Some of the Gujarat States	**15,407**
	A. British Gujarat	1,39,937
	B. Baroda (Gujarat area)	89,920
	C. Some of the States	15,407
		2,45,264
	Our estimate for the whole of Gujarat.	**4,00,000**

N.B.—This table has been computed from the Agricultural Statistics of India Volumes I and II, 1936-37 and the Administration Reports of the States concerned.

CHAPTER V. TABLE NO. 2.

Table giving the Road Mileage of British Gujarat, Baroda and Some of the Gujarat States.

Total area of the State Sq. miles.	State or District	Total Road Mileage	Motorable in fair Weather
10,193	British Gujarat	1561	*619
6,812	Baroda (Total area)‡	1791	*652
189	Balasinor	223	60
215	Bansda	98	† 61½
813	Bariya	182	91
350	Cambay	59	† 4½
873	Chhota Udepur	173	‡136
704	Dharampur	185	140
1,668	Idar	370	334
143	Jambughoda	60	...
1,150	Radhanpur	45	41
1,518	Rajpipla	1485	400
24,628	Total	6232	2539

Total $\frac{\text{above area 24,628 sq. miles}}{\text{Gujarat's area 33,798 sq. miles}}$ Statistics representing the conditions prevalent in 74 percent area of Gujarat.

N.B.—This table has been computed from the Bulletin issued by the Indian Roads and Transport Development Association Ltd. in 1938.

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* Of these roads 12 miles in British Gujarat and 14 miles in Baroda are asphalt roads.

† Of these roads 24 miles in British Gujarat, 1½ mile in Bansda, 1 mile in Cambay, 3 miles in Chhota Udepur are Macadam Surfaced Roads.

‡ According to the Statistical Abstract of the Baroda State 1941 publication Baroda (Gujarat area) has (Metalled Roads 305 miles plus Unmetalled Roads 1216 miles) 1521 miles Total Road Mileage.

CHAPTER V. TABLE NO. 3.

Table giving the details of Railways in Gujarat: their Mileage and Gauge.

Railway	Guage	Length in miles
A. B. B. & C. I. Railways—		
Bulsar to Viramgam	5–6	225.67
Ahmedabad–Dholka–Dhanduka ...	3–3⅜	72.15
Viramgam–Wadhwan	3–3⅜	39.05
Ahmedabad–Palanpur	3–3⅜	82.36
Kharaghoda–Viramgam	5–6	22.12
Anand–Godhra	5–6	48.95
Baroda–Godhra	5–6	42.37
Godhra–Dahod	5–6	45.41
Vasad–Kathana*	5–6	26.61
Boriavi–Vadtal	5–6	3.71
Tapti–Valley†	5–6	155.72
		764.12
B. Gaekwad's Baroda State Railways:—		
(1) Gaekwad's Mehsana Railway:		
(*a*) Viramgam–Mehsana Taranga Hill (*b*) Mehsana–Kakosi–Metrana (*c*) Manand Road-Harij (*d*) Chansma–Becharaji–Bhoyani Rd. (*e*) Vijapur Kadi and Ambaliyasana	3–3⅜	256.01
(2) Small branches in Gaekwad's territory.	2–6	355.73
(3) Gaekwad's Petlad Railway ...	5–6	21.42
(4) Broach Jambusar Jambusar–Kavi Samni–Dahej ‡	2–6	72.28
		705.44

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*Dismantled since 1940.

†Purchased by B. B. & C. I. Railway on 1–1–42.

‡Purchased by the Baroda State on 1–10–42.

CHAPTER V. TABLE NO. 3—*Contd.*

Railway	Guage	Length in miles.
***C.* Other State Railways :**		
Palanpur-Deesa	3-3⅜	17.11
Rajpipla State Railway	2-6	39.24
Tarapur-Cambay Railway	5-6	12.36
Piplod-Devgad Bariya	2-6	9.52
		78.23
***D.* Owned by Public Agencies :**		
*(1) Gujarat Railways :		
(*a*) Nadiad-Kapadvanj	2-6	28.18
(*b*) Godhra-Lunawada	2-6	25.49
(*c*) Champaner-Shivrajpur-Pani Mines.	2-6	30.68
(2) Ahmedabad-Prantij Railway :		
Ahmedabad-Himatnagar Himatnagar-Brahmkheda ...	3-3⅜	88.73
		173.08

		Mileage
A.	B. B. & C. I. Railways	764.12
B.	Gaekwad State Railways	705.44
C.	Railways Owned by the Other Gujarat States.	78.23
D.	Railways Owned by Public Companies ...	173.08
		1720.87

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*To be taken over by the Govt. of India in 1944.

CHAPTER V, TABLE NO. 4.

Table giving some idea about the existing Rail–Road Competition in British Gujarat.

From Station to Station	Distance Miles	Motor Buses Total
A. **Buses directly competing :**		
Ahmedabad to Sabarmati	5	3
Ahmedabad to Sanand	14	6
Ahmedabad to Naroda	5½	14
Sarkhej to Elis Bridge	7	15
Bavla to Elis Bridge	21	4
Dholka to Elis Bridge	29	2
Anand to Nadiad	13	22
Vasad to Borsad	13	5
Nadiad to Kapadvanj	28	13
Dakor to Umreth	5	7
Dakor to Shevaliya	13	1
Godhra to Kharsaliya	17	4
Godhra to Derol	15	
Godhra to Halol	24	1
Godhra to Shivrajpur	33	2
Broach to Jambusar	29½	2
B. **Buses indirectly competing :**		
Viramgam to Mandal	16	4
Anand to Borsad	22	14
Mehmedabad to Mahudha	12	5
Dakor to Kapadvanj	58	8
Total A Buses directly competing		262
B Buses indirectly competing		108
		370 miles

N.B.—This table is prepared from the findings of the Road and Railway Competition Committee in Governor's Provinces 1933.

N. B.

TOTAL POPULATION OF GUJARAT

A. According to our Tables Nos. 3, 5, 7 ... is 77,11,450

B. According to our Tables Nos. 6, 9 ... is 76,35,715

The above discrepancy is due to the inconsistency of the same being maintained in the Census Report for 1931.

"For, Imperial Table I (giving Area, Houses and Population),
Imperial Table II (giving variation in population since 1881),
Imperial Table III (giving Cities, Towns and Villages Classified by Population),
and Imperial Table IV (giving Cities and Towns Classified by Population with variations since 1881),

Population of Ahmedabad Municipal Area (which means of Ahmedabad City) has been estimated at 3,10,000, whereas in the remaining Tables, the figure shown is the one obtained by enumeration on the night of the Final Count."

Vide Census of India 1931, Bombay Presidency Census Report Vol. VIII, Part II, Page 1.

Moreover, refer to all other Imperial Tables from the Bombay Presidency Census Report 1931, there is also some note, giving the explanation of discrepancy in totals, is added either in the beginning or at the end of each table.

CHAPTER VI. TABLE No. 1.

Table showing the Area, Density of Population, Number of Towns and Villages.

States and Agencies	Area in Sq. Miles	Density per Sq. Mile	Towns	Vill-ages
A. **Western India States Agency:**				
Palanpur State	1,769	148.7	2	547
Radhanpur State	1,150	61.3	1	164
Banas Kantha Agency :				
Tharad State	1,261	43.0	...	164
Wao State	537	38.5	...	60
Malek Shri Jorawar Khan's State (Varahi)	120	25.0	...	15
Rest of the Banas Kantha Agency	1,557	80.6	...	320
Total A	6,394	84.1	3	1,270
B. **Baroda State** :				
Baroda City	11	10260.	2	...
Baroda Division	1,922	370.1	17	823
Mehsana Division	3,068	329.2	16	1,037
Navsari Division	1,811	223.2	9	776
Total B	6,812	328.6	44	2,636
C. **Bombay Presidency** :				
Ahmedabad District	3,846	259.9	12	869
Broach District	1,468	227.6	5	403
Kaira District	1,620	457.0	10	570
Panch Mahals	1,608	282.6	5	648
Surat District	1,651	420.1	5	780
Total C	10,193	316.2	37	3,270

CHAPTER VI. TABLE NO. 1—*Contd.*

State and Agencies	Area in Sq. Miles	Density per Sq. Mile	Towns	Villages
***D.* Bombay States and Agencies:**				
Cambay State	350	250.7	2	102
Mahikantha Agency:				
Idar State	1,668	157.4	3	1.067
Rest of the Mahikantha Agency	1,456	175.4	4	792
Revakantha Agency:				
Rajpipla State	1,518	135.7	2	712
Chhota-Udepur State	873	165.6	1	530
Devgad Bariya State	813	196.0	1	414
Lunawada State	388	245.2	1	339
Balasinor State	189	277.9	1	102
Sant State	394	212.0	1	277
Sankheda-Mewas State	323	183.0	...	312
Rest of the Revakantha State Agency	470	186.2	...	299
Bansda State	215	227.1	1	86
Dharampur State	704	159.1	1	265
Sachin State	42	526.3	1	20
Dangs	996	33.8	...	298
Total D	10,399	164.5	19	5,615
Grand Total	33,798	228,1	103	12,791

(*N. B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931).

CHAPTER VI. TABLE NO. 2.

Table showing Population Figures of last Six Censuses:—

State	1881	1891	1901	1911	1921	1931
A. **Western India States Agency :**—						
Palanpur ...	2,34,402	2,74,864	2,22,627	2,26,250	2,36,694	2,64,179
Radhanpur ...	98,129	98,017	61,548	65,567	67,789	70,530
Banas Kantha Agency ...	3,42,076	3,70,662	2,44,644	2,04,979	2,06,872	2,03,553
B. **Baroda State** :—(Amreli Division and Okhamandal excluded) ...	20,37,537	22,35,208	17,79,256	18,54,529	19,48,462	22,38,725
C. **Bombay Presidency** :—						
British Districts in Gujarat						
Ahmedabad ...	8,56,119	9,21,507	7,95,967	8,27,809	8,90,911	9,99,768
Broach ...	3,26,930	3,41,490	2,91,763	3,06,717	3,07,745	3,34,170
Kaira ...	8,05,005	8,71,794	7,16,332	6,91,744	7,10,982	7,41,650
Panch Mahals ...	2,55,479	3,13,417	2,61,020	3,22,695	3,74,860	4,54,526
Surat ...	6,14,198	6,49,989	6,37,017	6,54,109	6,74,351	6,93,613
D. **Bombay States and Agencies** :—						
Cambay ...	86,074	89,722	75,225	72,656	71,762	87,761
Mahikantha Agency ...	5,17,485	5,81,568	3,61,545	4,12,631	4,50,478	5,18,164
Revakantha Agency ...	5,49,892	7,33,506	4,79,065	6,65,099	7,53,058	8,88,086
Bansda ...	34,122	41,373	40,382	44,594	40,125	48,839
Dharampur ...	1,01,289	1,20,498	1,00,430	1,14,995	95,171	1,12,031
Sachin ...	15,721	19,353	20,492	18,903	19,977	22,107
Dangs ...	25,558	32,747	18,582	29,345	24,481	33,748

(*N.B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda States Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE NO. 3.

Table showing the Division of Rural and Urban Population with Males and Females :

STATES	Total Population	Urban		Rural	
		Males	Females	Males	Females
A. **Western India States Agency :—**					
Palanpur State ...	2,64,179	15,188	14,178	1,21,257	1,13,556
Radhanpur State ...	70,530	5,559	5,666	30,418	28,887
Banas Kantha Agency :—					
Tharad State ...	54,311	...	...	27,765	26,546
Wao State ...	20,721	...	...	10,613	10,108
Malek Shri Jorawar Khan's State (Varahi) ...	3,008	...	...	1,551	1,457
Rest of the Banas Kantha Agency...	1,25,513	...	...	65,741	59,772
Total A. ...	5,38,262	20,747	19,844	2,57,345	2,40,326
B. **Baroda State :—**					
Baroda City ...	1,12,860	62,744	50,116	...	...
Baroda Division ...	7,11,481	66,335	58,097	3,08,549	2,78,500
Mehsana Division ...	10,10,007	88,608	88,139	4,23,813	4,09,447
Navsari Division ...	4,04,377	30,295	30,292	1,72,873	1,70,917
Total B. ...	22,38,725	2,47,982	2,26,644	9,05,235	8,58,864

CHAPTER VI. TABLE NO. 3.—*contd.*

STATES	Total Population	Urban		Rural	
		Males	Females	Males	Females
C. **British Districts :—**					
Ahmedabad District ...	9,99,768	2,13,396	1,86,172	3,14,794	2,85,406
Broach District ...	3,34,170	36,999	31,881	1,37,895	1,27,395
Kaira District ...	7,41,650	66,458	59,162	3,28,646	2,87,384
Panch Mahals ...	4,54,526	38,926	33,892	1,97,696	1,84,012
Surat District ...	6,93,613	75,296	67,307	2,72,987	2,78,023
Total C. ...	32,23,727	4,31,075	3,78,414	12,52,018	11,62,220
D. **Bombay States and Agencies :—**					
Cambay State ...	87,761	18,818	17,643	28,033	23,267
Mahikantha Agency :—					
Idar State ...	2,62,660	7,528	7,453	1,24,399	1,23,280
Rest of the Mahikantha Agency ...	2,55,504	9,629	9,718	1,21,842	1,14,315
Reva Kantha Agency :—					
Rajpipla State ...	2,06,114	8,906	7,974	97,539	91,695
Chhota-Udepur State ...	1,44,640	3,567	2,867	71,542	66,664
Devgad-Bariya State ...	1,59,429	3,862	3,114	77,660	74,793
Lunawada State ...	95,162	5,768	6,128	43,470	39,796
Balasinor State ...	52,525	4,928	4,782	22,455	20,360
Sant State ...	83,531	1,947	1,904	40,875	38,805

Sankheda-Mewas ...	59,139	...	...	30,642	28,497
Rest of Revakantha Agency ...	87,546	...	...	45,972	41,547
Bansda State ...	48,839	2,253	2,086	23,260	21,240
Dharampur State ...	1,12,031	3,572	3,646	54,391	50,422
Sachin State ...	22,107	648	541	9,928	10,990
Dangs ...	33,748	...	...	18,268	15,480
Total D. ...	17,10,736	71,426	67,856	8,10,276	7,61,178
Grand Total A.B.C. & D. ...	77,11,450	7,71,230	6,92,758	32,24,[illegible]74	30,33,588

Total	Total Population	Urban	Rural
A	5,38,262	40,591	4,97,671
B	22,38,725	4,74,626	17,64,099
C	32,23,727	8,09,489	24,14,238
D	17,10,736	1,39,282	15,71,454
Grand Total	77,11,450	14,63,988	62,47,462

(*N.B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE NO. 4.

Table showing Percentage of Urban Population in principal units of Gujarat.

UNIT	No. of Towns	Percentage of Urban Population to Total Population
Palanpur State	2	11
Radhanpur State	1	16
Tharad State	...	...
Wao State	...	...
Malek Shri Jorawar Khan's State (Varahi)	...	...
Baroda City	2	100
Baroda Division	17	17
Mehsana Division	16	17
Navsari Division	9	15
Ahmedabad District	12	40
Broach District	5	21
Kaira District	10	17
Panch Mahals	5	16
Surat District	5	21
Cambay State	2	42
Idar State	3	6
Rajpipla State	2	8
Chhota-Udepur State	1	4
Devgad-Bariya State	1	4
Lunawada State	1	13
Balasinor State	1	18
Sant State	1	5
Sankheda-Mewas	...	...
Bansda State	1	9
Dharampur State	1	6
Sachin State	1	5
Dangs	...	...

(*N.B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE No. 5

Table showing Cities, Towns and Villages classified by Population.

STATE	No. of Towns and Villages	Population	Under 500		500–1000		1000–2000		2000–5000		5000–10000		10000–20000		20000–50000		50000–100000		100000 & over	
			No.	Population	No.	Population	No.	Population	No.	Population	No.	Population	No.	Population	No.	Population	No.	Population	No.	Population
A. **Western India States Agency :**																				
Palanpur State	549	264179	399	94005	106	70745	31	42429	11	27634	1	9019	...	...	1	20347	...	...	...	...
Radhanpur State	165	70530	131	29571	26	18972	6	7123	1	3639	...	...	1	11225	...	...	...	...	...	...
Banas Kantha Agency :																				
Tharad State	164	54311	137	31742	23	14318	3	4008	1	4243	...	...	...	...	...	...	...	...	...	...
Wao State	60	20721	49	10038	8	4940	2	2984	1	2759	...	...	...	...	...	...	...	...	...	...
Malek Shri Jorawar Khan's State (Varahi)	15	3008	15	3008	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rest of the Banas Kantha Agency	320	125313	249	60641	54	35778	13	19820	4	9274	...	...	...	...	...	...	...	...	...	...
Total A	1273	538262	980	229005	217	144753	55	76364	18	47549	1	9019	1	11225	1	20347	...	...	...	...
B. **Baroda State :**																				
Baroda City and Cantonment	2	112860	...	...	...	...	...	...	1	3221	...	...	...	...	...	...	...	...	1	109639
Baroda Division	840	711481	415	111921	231	163637	128	177089	54	152106	8	48308	4	58420	...	...	...	...	...	...
Mehsana Division	1053	1010007	455	123087	312	223485	162	262966	80	230684	7	52184	5	67303	2	50298	...	...	...	...
Navsari Division	785	404377	544	121601	154	104497	66	85495	15	36238	5	32149	...	...	1	24397	...	...	...	...
Total B	2680	2238725	1414	356609	697	491619	386	525550	150	422249	20	132641	9	125763	3	74695	...	...	1	109639
C. **British Districts :**																				
Ahmedabad Dist.	881	999768	443	126587	252	177636	138	181473	30	79478	15	91886	2	32708	...	...	...	...	1	310000
Broach District	408	334170	213	60396	123	87782	50	70095	17	46989	2	10845	2	23759	1	34276	...	...	...	...
Kaira District	580	741650	183	56547	171	126821	139	199117	74	209405	8	58990	4	56186	1	34584	...	...	...	...
Panch Mahals	653	454626	370	98022	186	130716	67	87528	26	68963	2	12094	...	...	2	57203	...	...	...	...
Surat District	785	693613	400	104538	212	147024	123	166113	44	128260	3	16858	2	31825	...	...	1	98936	...	...
Total C	3307	3223727	1609	446090	914	669979	517	704326	191	533095	30	190673	10	144478	4	126063	1	98936	1	3100

[*P. T. O.*]

ABLE No. 5—*Contd.*

2000-5000		5000-10000		10000-20000		20000-50000		50000-100000		190000 & over	
No.	Population	No.	Population	No.	Population	No.	Population	No.	Population	No.	Population
4	12597	...	...	...	...	1	31877	...	...	...	...
5	15892	1	5635	...	...	...	...	...	...	...	...
8	21120	2	14432	...	...	...	...	...	...	...	...
6	14988	...	...	1	13302	...	...	...	...	...	...
...	...	1	6434	...	...	...	...	...	...	...	...
3	6258	1	6976	...	...	..	...	...	...	...	...
1	2731	...	...	1	11896	...	...	...	...	...	...
1	3863	1	9710	...	...	...	...	...	...	...	...
1	3851	...	...	...	...	...	...	...	...	...	...
1	2506	...	...	...	...	...	...	...	...	...	...
3	9227	...	...	...	...	...	...	...	...	...	...
2	6412	...	...	...	...	...	...	...	...	...	...
4	8867	1	7218	...	...	...	...	...	...	...	...
3	8051	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
42	116363	7	50405	2	25198	1	31877	...	...	...	...
01	1119256	58	382738	22	306624	9	252982	1	98936	2	419639
18	47549	1	9019	1	11225	1	20347	...	...	...	...
50	422249	20	132641	9	125723	3	74695	...	...	1	109639
91	533095	30	190673	10	144478	4	126063	1	98936	1	310000
42	116363	7	50405	2	25198	1	31877	...	...	...	...
01	1119256	58	382738	22	306624	9	252982	1	98936	2	419639

the Western India States Agency, the Baroda State's Census Report and, the Bombay

CHAPTER VI. TABLE No. 7.

Table showing the Distribution of Population into Males and Females.

States	Total Population	Males	Females
A. **Western India States Agency** :—			
Palanpur States ...	2,64,179	1,36,445	1,27,734
Radhanpur State ...	70,530	35,977	34,553
Banas Kantha Agency :—			
Tharad State ...	54,311	27,765	26,546
Wao State ...	2,0721	10,613	10,108
Malek Shri Jorawar Khan's State (Varahi)...	3,008	1,551	1,457
Rest of the Banas Kantha Agency ...	1,25,513	65,741	59,772
Total A.	5,38,262	2,78,092	2,60,170
B. **Baroda State** :—			
Baroda City and Cantonment ...	1,12,860	62,744	50,116
Baroda Division ...	7,11,481	3,74,884	3,36,597
Mehsana Division ...	10,10,007	5,12,421	4,97,586
Navsari Division ...	4,04,377	2,03,168	2,01,209
Total B.	22,38,725	11,53,217	10,85,508
C. **British Districts** :—			
Ahmedabad District ...	9,99,768	5,28,190	4,71,578
Broach District ...	3,34,170	1,74,894	1,59,276
Kaira District ...	7,41,650	3,95,104	3,46,546
Panch Mahals ...	4,54,526	2,36,622	2,17,904
Surat District ...	6,93,613	3,48,283	3,45,330
Total C.	32,23,727	16,83,093	15,40,634

CHAPTER VI. TABLE NO. 7—*Contd.*

States	Total Population	Males	Females
D. **Bombay States and Agencies:**			
Cambay State ...	87,761	46,851	40,910
Mahikantha Agency :			
Idar State ...	2,62,660	1,31,927	1,30,733
Rest of the Mahikantha Agency ...	2,55,504	1.31,471	1,24,033
Revakantha Agency :			
Rajpipla State ...	2,06,114	1,06,445	99,669
Chhota-Udepur State ...	1,44,640	75,109	69,531
Devgad Bariya State ...	1,59,429	81,522	77,907
Lunawada State ...	95,162	49,238	45,924
Balasinor State ...	52,525	27,383	25,142
Sant State ...	83,531	42,822	40,709
Sankheda-Mewas State ...	59,139	30,642	28,497
Rest of the Revakantha State Agency ...	87,546	45,972	41,574
Bansda State ...	48,839	25,513	23,326
Dharampur State ...	1,12,031	57,963	54,068
Sachin State ...	22,107	10,576	11,531
Dangs ...	33,748	18,268	15,480
Total D	17,10,736	8,81,702	8,29,034
Grand Total A, B, C & D	77,11,450	39,96,104	37,15,346

(*N. B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE NO. 8.

Table showing Ratio of Females per 1000 Males.

STATES	Females per 1000 males	
GUJARAT		930
A. **Western India States Agency**:		
Palanpur State	941	
Radhanpur State	972	
Banas Kantha Agency:		925
Tharad State	964	
Wao State	982	
Malek Shri Jorawar Khan's State (Varahi)	939	
Rest of the Banas Kantha Agency	909	
B. **Baroda State** (Okhamandal and Amreli excluded)		942
Baroda City and Cantonment	794	
Baroda Division	899	
Mehsana Division	973	
Navsari Division	990	
C. **British Districts in Gujarat**:		916
Ahmedabad District	894	
Broach District	909	
Kaira District	878	
Panch Mahals	920	
Surat District	991	

CHAPTER VI. TABLE NO. 8—*contd.*

STATES	Females per 1000 males	
D. Bombay States and Agencies in Gujarat		940
Cambay State ...	872	
Mahikantha Agency		970
Idar State ...	992	
Rest of the Mahikantha Agency ...	947	
Revakantha Agency		935
Rajapipla State ...	944	
Chhota-Udepur State ...	933	
Devgad-Bariya State ...	951	
Lunawada State ...	939	
Balasinor State ...	926	
Sant State ...	953	
Sankheda-Mewas ...	903	
Rest of the Revakantha Agency ...	913	
Bansda State ...	885	
Dharampur State ...	931	
Sachin State ...	1091	
Dangs ...	833	

(*N. B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE NO. 9.

Table showing Literacy by Age and Sex in Gujarat

AGE	TOTAL			LITERATE		
	Persons	Males	Females	Persons	Males	Females
0—5 ...	11,36,784	5,65 827	5,70,957	...	...	...
5—10 ...	10,16 981	5,34,915	4,82,066	74 196	56,122	18,074
10—15 ...	9,34,576	5,00,313	4,34,263	1,23,695	96,138	28,557
15—20 ...	7,26,162	3,77,075	3,49,087	1,44,398	1,16,169	28,229
20 and over ...	38,11,151	19,81,889	18,29,262	5,97,202	5,29,454	67,748
Unspecified ...	10,061	5,411	4,650	...	...	...
Total ...	76,35,715	39,65,430	36,70,285	9,39,491	7,96,883	1,42,608

AGE	ILLITERATE			LITERATE IN ENGLISH		
	Persons	Males	Females	Persons	Males	Females
0—5 ...	11,36,784	5,65,827	5,70,957	...	...	...
5—10 ...	9,42,785	4,78,793	4,63,992	1,590	1,351	239
10—15 ...	8,10,881	4,05,175	4,05,706	5,877	5,253	624
15—20 ...	5,81,764	2,60,906	3,20,858	15,104	14,001	1,103
20 and over ...	32,13,949	14,52,435	17,61,514	51,830	48,878	2,952
Unspecified ...	...	...	...	...	...	...
Total ...	66,86,163	31,63,136	35,23,027	74,401	69,483	4,918

CHAPTER VI. TABLE NO. 10.

Table showing Occupations or Means of Livelihood.

Occupation	Total following Occupation	As Principal Occupation		As Working Dependents		As Subsidiary to other Occupation	
		Males	Females	Males	Females	Males	Females
Total all Classes ...	36 30,492	19,39,601	4,34,476	3,61,964	7,73,971	1,10,397	10,083
Class A Production of Raw Materials ...	26,27,576	12,96,811	2,86,957	3,02,534	6,80,269	55,535	5,470
Class B Preparation and Supply of Material substances ..	5,78,819	4,00,647	67,517	34,368	42,359	31,609	2,319
Class C Public Administration and Liberal Arts ...	1,26,834	1,03,117	6,674	4,082	1,573	11,101	287
Class D Miscellaneous ...	2,97,263	1,39,026	73,328	20,980	49,770	12,152	2,007

(*N. B.*—The above Tables have been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE NO. 11

Table showing the Distribution of Workers in the various Occupations.

Nos.	Sub Class	As Principal Occupation		As Working Dependents		As Subsidiary to other Occupation	
		Males	Females	Males	Females	Males	Females
	Class A.						
I	Exploitation of Animals and Vegetation ...	12,93,486	2,86,355	3,02,273	6,79,889	54,760	5,330
II	Minerals ...	3,325	602	261	380	775	140
	Class B.						
III	Industry ...	2,46,606	47,581	23,302	33,115	17,230	1,467
IV	Transport ...	37,754	4,731	1,853	753	3,198	59
V	Trade ...	1,16,287	15,205	9,213	8,491	11,181	793
	Class C.						
VI	Public Force ...	23,459	85	277	139	2,770	17
VII	Public Administration ...	32,381	1,356	885	572	4,647	40
VIII	Professions and Liberal Arts ...	47,277	5,233	2,920	1,062	3,684	230
	Class D.						
IX	Persons living on their Income ...	11,049	2,667	648	90	1,172	108
X	Domestic Service ...	26,224	3,378	1,371	1,547	1,246	114
XI	Insufficiently described Occupations ...	83,464	63,983	13,540	45,244	8,757	1,635
XII	Unproductive ...	18,289	3,300	5,421	2,889	977	150
	Total ...	19,39,601	4,34,476	3,61,964	7,73,971	1,10,397	10,083

CHAPTER VI. TABLE NO. 12.

Table showing the Details of Sub Class III—Industry.

Order No.	Description	Principal Occupation		Working Dependents		Subsidiary	
		Males	Females	Males	Females	Males	Females
5	Textiles ...	87,576	24,359	7,016	5,931	2,977	618
6	Hides, Skins, etc. ...	14,677	1,710	1,422	3,096	1,833	71
7	Wood ...	28,261	2,390	2,656	3,268	3.709	226
8	Metals ...	12,903	443	1,486	662	995	29
9	Ceramics ...	18,479	3,465	2,987	8,080	2,111	140
10	Chemical Products ...	7,548	1,700	894	1,655	555	89
11	Food ...	6,696	2,289	597	731	1,118	118
12	Dress and the Toilet ...	36,992	6,459	3,688	6.367	2,306	103
14	Building, etc. ...	13,028	1,311	608	396	952	18
17	Miscellaneous and Undefined ...	19,280	3,383	1,857	1,914	520	47
	Total...	2,45,440	47,509	23,211	33,100	16,476	1,459

(*N. B.*—The above Tables have been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VI. TABLE No. 13.

Table showing the Details of Sub Class V—Trade.

Order No.	Description	Earners		Working Dependents		Subsidiary	
		Males	Females	Males	Females	Males	Females
23	Banks, establishments of credits, etc.	12,476	1,449	645	248	2,670	71
24	Brokerage, commission agents, etc.	963	35	50	11	173	5
25	Trade in Textile	11,477	185	873	102	854	26
26	Trade in skins, leather, etc.	1,119	53	100	49	182	1
27	Trade in Wood	771	130	37	138	44	16
31	Hotels, cafes, restaurants, etc.	6,572	277	639	147	722	12
32	Other Trade in food-stuffs	44,907	10,159	3,849	5,503	3,850	405
36	Trade in means of transport	2,398	13	210	356	475	...
37	Trade in fuel	1,413	641	134	513	251	149
38	Trade in articles of luxury	1,886	89	145	57	48	10
39	Trade in other sorts	29,650	2,027	2,305	1,327	1,867	77
	Total	1,13,632	15,058	8,987	8,451	11,136	772

(*N.B.*—This Table has been computed from the Census of Population Report of the Western India States Agency, the Baroda State's Census Report, and, the Bombay Presidency Census Report for 1931.)

CHAPTER VII. TABLE NO. 1.

Table showing Persons Employed under Major Occupational Heads in Gujarat.

INDUSTRY	Principal Occupations.		Working Dependents		Subsidiary	
	Males	Females	Males	Females	Males	Females
Textiles ...	87,576	24,359	7,016	6,931	2,977	618
Toilet and Dress ...	36,992	6,459	3,688	6,367	2,306	103
Wood ...	28,261	2,390	2,656	3,268	3,709	226
Building ...	13,028	1,311	608	396	952	18
Ceramics ...	18,479	3,465	2,987	8,080	2,111	140
Metals ...	12,903	443	1,486	662	995	29
Chemical Products ...	7,548	1,700	894	1,655	655	89
Food Industries ...	6,696	2,289	597	731	1,118	118
Hides, Skins, etc., ...	14,677	1,710	1,422	3,096	1,833	71
Furniture Industries.	687	58	85	54	28	7
Production & Transmission of Physical force ...	337	10	4	...	2	...
Construction of means of Transport.	232	4	2	1	24	1
Miscellaneous & Undefined Industries.	19,280	3,383	1,857	1,914	520	47
Total ...	2,46,696	47,581	23,302	33,155	16,530	1,467

(*N.B.*—This table is computed with the help of the Western India States Agency, Baroda State and the Bombay Presidency Census Reports.)

CHAPTER VII. TABLE NO. 2.

Table showing the Artisans in Gujarat

OCCUPATIONS	Earners		Working Dependents		Subsidiary	
	Males	Fe-males	Males	Fe-males	Males	Fe-males
Workers in Leather ...	2,922	109	296	420	342	9
Carpenters, etc. ...	21,627	270	1,750	278	1,777	34
Basket makers, etc. ...	5,143	2,082	800	2,931	670	191
Blacksmiths, etc. ...	10,007	414	1,203	595	961	29
Workers in brass, copper and bell metal ...	2,457	6	253	7	13	...
Other metal workers ...	178	8	14	12	1	...
Potters ...	15,019	2,856	2,598	7,149	1,613	115
Brick and Tile makers ...	3,295	566	369	890	469	25
Other workers in Ceramics.	165	43	20	41	29	...
Vegetable oil workers ...	6,215	1,053	794	1,395	619	68
Other oils ...	117	253	15	37	4	10
Rice pounders, etc. ...	971	1,582	78	494	29	42
Grain parchers ...	192	50	20	38	4	7
Makers of Sugar Molasses and Gur ...	257	18	17	...	1	...
Sweetmeat makers, etc ...	1,266	115	70	89	515	53
Other Food Industries ...	584	16	41	5	67	...
Boot, Shoes, etc, makers ...	3,642	221	374	748	191	6
Embroiders, Hat makers, etc.	87	65	18	96	4	1
Other (dress and toilet) ...	14	1	5	...	...	...
Cabinet makers, etc., ...	623	27	83	17	16	...
Upholsterers, etc. ...	64	31	2	37	12	7
Lime-burners, etc. ...	13,028	1,311	608	396	952	18
Total ...	87,943	11,079	9,428	15,675	5,269	615

(*N.B.*—Table worked out from the Census Reports.)

CHAPTER VII. TABLE NO. 3.

Important Handloom Centres of Gujarat together with the yarn used at these centres :—

Centre	No. of looms	Yarn used
British Gujarat :—		
Ahmedabad ...	500	...
Dholka ...	335	60^{s}, 80^{s}.
Chaloda ...	60	30^{s}, 20^{s}, 6^{s}, 8^{s}.
Bavla ...	15	Rough Khaddar Weaving
Nadiad ...	20	do
Kaira ...	30	8^{s}, 20^{s}.
Vadtal ...	40	$20\frac{1}{2}$, $6\frac{1}{2}^{s}$.
Borsad ...	40	$10\frac{1}{2}$
Karamsad ...	12	$8\frac{1}{2}^{s}$, 29^{s}, $2/20^{s}$, $2/130^{s}$ $2/40^{s}$, and $2/84^{s}$.
Uttarsanda ...	15	20^{s}.
Gutal ...	9	20^{s}.
Surat ...	700	...
Mandvi ...	93	30, 40.
Chikhli ...	33	30, 40.
Pardi ...	22	...
Bardoli ...	45	30, 40.
Bulsar ...	70 Sari Wvg. 25 Mast cloth Wvg.	30, 40, 24.

CHAPTER VII. TABLE No. 3—*Contd.*

Centre	No. of looms	Yarn used
Broach ...	101	$20\frac{1}{2}^{s}$, $10\frac{1}{2}^{s}$.
Ankleshwar ...	70	...
Dahod ...	30	...
Katwara ...	40	(15 handlooms using mill wastage) (yarn 25 weaving rough khaddar.)
Garbada ...	8	Rough Khaddar.
Baroda State :—		
Patan ...	500	40, 50.
Petlad ...	200	Mill wastage yarn (Hirkori, Dhottars) plus coarse counts for Rough Khaddar.
Baroda ...	150	80^{s}, 100^{s}, 120^{s}, 30^{s}, and 40^{s}.
Gandevi ...	125	30, 40.
Vaso ...	100	...
Visnagar ...	75	Rough Khaddar.
Visnagar Side ...	100	do do
Kherabi Side ...	100	do do
Sankheda ...	10	
Rest of Gujarat :—		
Palanpur State		
Kanodar ...	600	2/20
Rest of Palanpur ...	100	Rough Khaddar
Radhanpur State ...	50	do do
Sami ...	15	do do
Idar State (Vadali) ...	50	do do
Cambay ...	2088	Sari 2/80; Carpets 2/6
Lunawada ...	30	Rough Khaddar
Rampur ...	10	do do

QUESTIONNAIRES

I. GENERAL QUESTIONNAIRE

I. What are the raw materials (agricultural produce, mineral resources, forest and marine products) produced in your State or District which can be used for industrial purposes?

II. Which of these are being utilised for:

(*i*) Cottage Industries,
(*ii*) Large Scale Production,
and (*iii*) Machine Production.

III. Please state—

(*i*) the Existing Industries,
(*ii*) the Dying Industries,
and (*iii*) the Extinct Industries,

in your State or District, and, give reasons for their present condition.

IV. What according to you are the main hindrances in the way of the utilisation of the wealth of your State or District.

How according to you can they be removed? Suggest under—

(*i*) Transport
(*ii*) Finance
(*iii*) Expert Guidance
(*iv*) Skilled Labour
(*v*) Competition
(*vi*) State Monopolies
and (*viii*) Other Measures.

V. Please describe the existing sources from which Industries get their finance. To what extent are they adequate?

VI. Is proper publicity to the products of your State or District given? Suggest ways to improve the marketing of the same.

VII. What are the possibilities of new Industries in your State or District?

VIII. What has been the policy of your Government regarding the Industrial Development of your State or District? What active steps have been taken in this direction

(*a*) for Existing Industries,
and (*b*) for New Industries.

IX. Has the co-operative method been tried for developing Industries in your State or District? Do you think that progress can be achieved by this method?

X. Is the State directly managing any Industry or granting monopolies to individuals in your State or District? If so, what has been the experience?

XI. What is the nature of inter-state tariff legislation round about your State or District? What are its repurcussions? Is a Customs Union feasible?

XII. State any other suggestions you can make regarding the development of a specific Industry or Industries in general, in Gujarat or in any part thereof.

• • •

II. ARTISAN'S QUESTIONNAIRE

I. Name.

II. Address.

III. In what Industry are you occupied? How long are you working in this Industry?

IV. Please mention different products made by you.

V. What are the raw materials used by you and how are you getting those raw materials?

VI. Please enumerate all the machines, tools and appliances used by you. What is the motive power employed by you for running your machinery?

VII. How are you financing

- (*i*) the purchase of raw materials,
- (*ii*) the purchase of machines,
- and (*iii*) the movement of goods from one place to the other.

VIII. Are there any difficulties in marketing your products? If so what are they?

IX. What hindrances are there in the development of your industries due to

- (*i*) State Monopolies,
- (*ii*) Inter-State Tariffs,
- (*iii*) Municipal or State Taxation,
- and (*iv*) Want of Skilled labour and expert advice.

X. What assistance are you getting at present from:

- (*i*) Any Guild,
- (*ii*) Any Co-operative Society,
- (*iii*) Your Community,
- and (*iv*) Government.

What assistance do you want from these people?

XI. Describe in detail the nature of competition you are facing. What aid do you want in this connection?

XII. How many people are employed by you in your Karkhana? How many Karkhanas are there of your type in your territory?

XIII. What improvements would you suggest in improving the facilities for getting capital?

XIV. Have you anything to say regarding the general industrial development of your State or District?

• • •

III. DEALER'S QUESTIONNAIRE

I. Name.

II. Address.

III. Please indicate all the products sold by you. Of these

- (*i*) how many are prepared in your State or District?
- (*ii*) India,

and (*iii*) Foreign countries ?

IV. How are you getting those products ? Please state whether these goods are:

(*i*) made to order,
(*ii*) obtained through middlemen,
or (*iii*) imported directly from outside.

V. How are you financing your business ? Plase state whether the funds are:

(*i*) owned by you,
(*ii*) borrowed from co-operative Societies,
or (*iii*) borrowed from private individuals or any other agency.

VI. Are you selling wholesale or retail ?

VII. What are the terms and conditions of your sales ?

VIII. Are you finding any difficulty in selling the products of your State or District ? If so, why ?

IX. Please enumerate the names of products for which demand is either rapidly increasing ? Are they produced in your State or District ?

X. Can you throw any light on the demand for the hand made products or the manufactures of your State or District which have experienced market rise or fall during the last decade ?

XI. Are any of the products of your State or District facing competition from foreign or Indian

(*i*) Hand made substitutes,
or (*ii*) Machine made products ?

Please state what according to you should be done to improve the situation.

XII. Have you any suggestions to make regarding general idustrial development of your State or District ?

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